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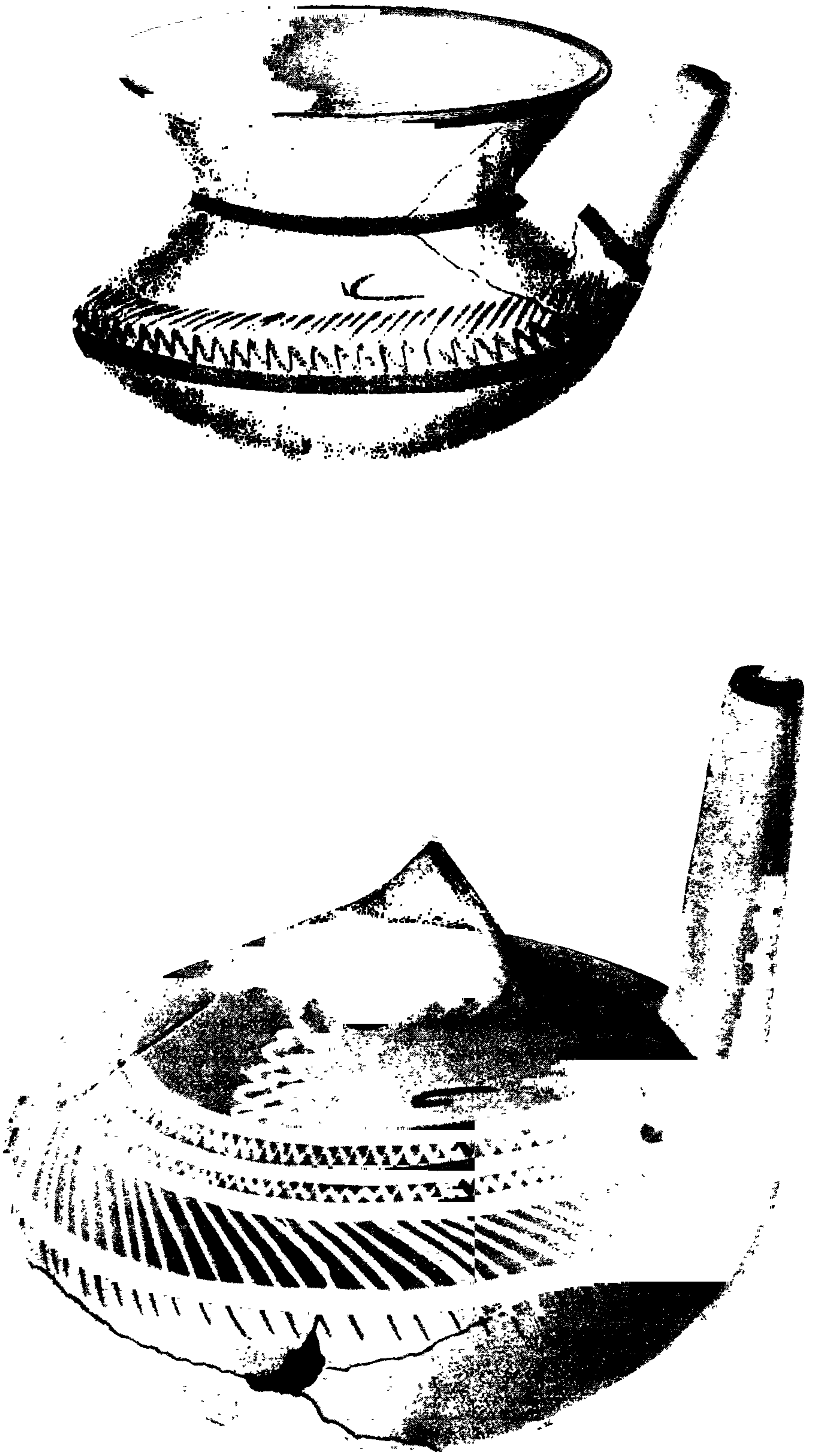
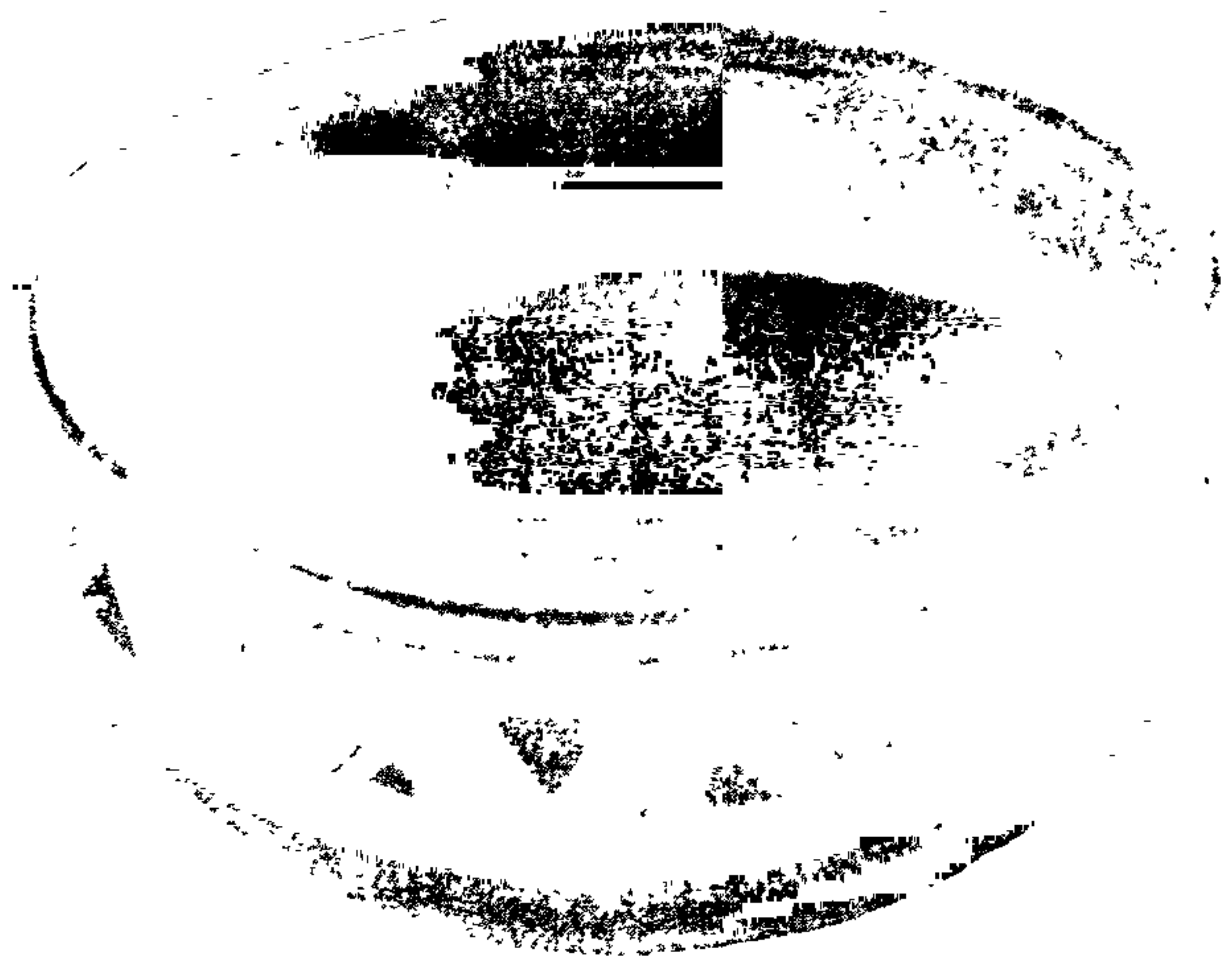


Frontispiece (Fig. 91.) Spouted Pots in Jorwe Ware from Nevasa.

School of Archaeology.



Frontispiece (Fig. 91.1.) Spouted Pot and Carinated Bowl, Nevasa.

Prehistory and Protohistory in India and Pakistan

PREHISTORY AND PROTOHISTORY
IN
INDIA AND PAKISTAN

By

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TO

Late Professor Dr. B. Subbarao,

a brilliant pupil

and

esteemed colleague

UNIVERSITY OF BOMBAY

Pandit Bhagwanlal Indraji Lectures

Delivered between 6th-13th December, 1960.

FOREWORD

THIS book has been written on the basis of the Pandit Bhagwanlal Indraji Lectures which Dr. H. D. Sankalia delivered under the auspices of the University of Bombay in December 1960. The author since then revised and elaborated the original text and prepared the present work which is now being published by the University.

Dr. Sankalia, who is in charge of the Department of Ancient Indian Culture and Archaeology, University of Poona, and who is Professor of Proto-Indian and Ancient Indian History, Deccan College Post-graduate and Research Institute, Poona, has been actively associated with archaeological expeditions and field work connected with discovering pre-historic finds over vast areas and a protracted period. Basing his conclusions invariably on first hand knowledge of relevant material and a study of available literature, he presents here a synthetic summary and analytical survey of the important findings in the major pre-historic sites in India, Pakistan and the neighbouring countries.

Pre-historic studies proper are known to be a hundred years old in India. But there was a rare moment in this period when understanding took a long leap forward with the spectacular discovery of an entire proto-historic civilization—that of Mohenjodaro and Harappa, which has since become a focal centre of research. And it is the spade, *inter alia*, of Dr. Sankalia that gave convincing testimony of the spread of Indus Valley civilization. In this work, Dr. Sankalia has preferred to concentrate more on one comprehensive topic, the study in its totality of the pre-historic background of Indian culture. Three valuable qualities are revealed in this work : detailed knowledge of the facts of Indian archaeology ; craftsmanlike standards of accuracy, organization, and scholarship ; critical caution towards generalised schemes of interpretation and interpolation of archaeological data.

A number of years have gone into the making of this comprehensive work. The result is an excellent review of the contributions, including his own, to the pre and proto-history of India and Pakistan from its early beginnings, together with the presentation of recent developments that have brought a new surge of progress and changed many past concepts. He has sifted information and arranged it in the proper perspective on the basis of accepted methods. In this process emerges a full length picture of transitions from pre-historic barbarism commencing with early paleolithic (150,000 B.C.) through the middle paleolithic (25,000 B.C.) down to the ' modern ' (circa 500 B.C.) periods : neolithic chaleolithic and bronze age, and the highly individually patterned beginnings of civilized life.

Wide in scope, for the general well-informed reader as well as the scholar, abounding in rich details, intellectually stimulating, the lectures have the authority that comes from an expert writing in his own speciality and bring the picture of Man-in-India's earliest beginnings into a sharp focus.

A comparison of the results of excavations and comparative studies integrated in this study with the pitiably small knowledge we had of the pre-history of India and Pakistan little more than forty years ago will clearly show the vast strides forward that have been made in this field. I have little doubt that this ambitious undertaking, built on painstaking field work and scholarly study will be welcome to all concerned and that it would greatly help and stimulate comparative research in this field.

University of Bombay
Bombay, 9th March, 1963

R. V. SATHE
Vice-Chancellor

PREFACE

THE University of Bombay instituted a new series of lectures named after the late Pandit Dr. BHAGWANLAL INDRAJI. BHAGWANLAL INDRAJI has been known as a pioneer worker in epigraphy, numismatics and other allied subjects of historical archaeology. Many of his conclusions arrived at after a great deal of careful study and field-work have not been, for the last 100 years, refuted, which testifies to his great scholarship. Much is written about his epigraphical and numismatical work. It is not, however, realized that BHAGWANLAL was also a great and careful excavator. Even without undergoing any training in this discipline of excavation, as in the disciplines of epigraphy and numismatics, his observations on the stratigraphy of the burial mound at Govardhan, about six miles west of Nasik will do credit to any archaeologist of today, whether trained by Sir MORTIMER WHEELER or General PITT RIVERS in England. This work of BHAGWANLAL done in 1883 should be noted, because it has escaped the attention of the writers of his biography, and in this era of scientific archaeology, we should credit the person not only for the work he did in epigraphy and numismatics but in scientific excavation as well.

It was therefore a great privilege and honour to be invited by the University of Bombay to deliver these lectures named after Pandit Dr. BHAGWANLAL INDRAJI. Though the subject is one in which he did not do much work, it has been mentioned above that he had tried his hand at excavation and that too quite successfully.

When the lectures were first announced and delivered, they were under the title *Prehistoric Archaeology of India.* It has been now deemed fit to call the subject *Prehistory and Proto-history in India and Pakistan.*

The aim has been to offer a critical review of the work done in these two branches of archaeology in this sub-continent during the last twenty years or so. Naturally the concepts of prehistory and protohistory have been briefly examined and clarified as far as the current evidence permits. But while doing so no new theories or hypotheses about the origin of civilization have been advanced. Though in any field of investigation or research, there should be some hypotheses to start with, yet the writer feels that these should legitimately follow when sufficient data have been gathered. The emphasis is therefore on careful collection of the material. Distribution charts and maps based on inadequate evidence are likely to mislead and give rise to false notions. Hence in the present work besides indicating the distribution of various industries or assemblages of objects in each region, the distribution of the entire group is shown against a specific background, viz. physiographical features of India so that it may help in independently evaluating certain theories about the spread of civilization in India.

Since the emphasis is being put on facts, the narrative is so planned that inferences or conclusions are not mixed up with any preconceived theories, but the latter follow the main account and can be appraised independently and objectively. The facts themselves have been gathered in two ways : firstly from a first-hand study of the objects and accounts of excavations and explora-

tions conducted by the author, his colleagues and pupils at the Deccan College in several parts of India : and secondly, from a first-hand study, *as far as possible*, of the work done by the members of the Archaeological Survey of India, as well as other Directors of Archaeology in various States, and their colleagues and Professors in Indian Universities.

Certain limitations on the scope and treatment have had to be imposed by the nature of the material. Though a first-hand study was carried out, whenever possible, reliance had to be placed upon the brief announcements of excavations and explorations in *Indian Archaeology - A Review*. These announcements, however welcome and excellent in their own way, can never take the place of full or even interim, well-written, definitive reports. Unfortunately the latter are not available in a number of cases. And it is doubtful, if many will ever see the light of the day ; or if published after years, they will be as good as still-born.

Secondly, a detailed review of the Indus Civilization and the Baluchistan pottery is omitted from this work, because a number of excellent publications on the subject exist. So also a reference to megaliths and rock-shelters and paintings ; both these are well discussed by Sir MORTIMER WHEELER and the late Colonel GORDON in their respective works. And the writer has nothing new to offer. Likewise a part of Chapter IV, "Neolithic and Chalcolithic Cultures," has already appeared in the author's *Indian Archaeology Today*. Still, opportunity has been taken to bring it uptodate, important additions being references to excavations at Ahar, Eran, Kalibangan and explorations on the Makran coast and Rajar Dhipi and their dating by Carbon-14 method.

A few implications of these new developments may be pointed out here. C-14 dates for Lothal and Kalibangan indicate that the Indus Civilization was on the decline, both in the present Bikaner region as well as in Saurashtra by 1800 B.C. Thus the view that the Aryans had brought its end by 1500 B.C.—1200 B.C. needs to be revised. The end had come at least 300 years earlier. Now it is at this very moment that we have Chalcolithic or Copper Age Cultures not only in Sind, (for which no C-14 dates are at present available, like Jhukar and Jhangar), but also in South-East Rajasthan, Central India and Saurashtra as well as in the Deccan. The earliest phases of Eran, Navdatoli and Ahar go back to a period between 2100—1800 B.C. The presumption is not unwarranted that these extra-Indus cultures had some share in bringing about the down-fall of and/or alteration in the Indus Civilization at home as well as in the outlying provinces.

Evidence is also accumulating from the excavations at Ahar about the early smelting or refining of copper. Chemical analysis by the author's colleagues suggests that the local sources were exploited. Likewise very interesting information is coming forth from the explorations and excavations of Shri P. C. DAS GUPTA and his assistants in the Ajay Valley, Burdwan District, West Bengal. Chances are that here we shall have proof of the earliest use of iron by a people who seem to have been familiar with the painted pottery tradition of a still remoter age. Whatever be the final outcome, further extended work in the Chota Nagpur plateau will help fill up the gap between history and protohistory and explain the role of primitive tribes like Savaras and Santhals in it.

Further, this and other chapters have been more fully illustrated by line-drawings, distributions maps and a few photographs. To keep down the cost of block-making, considerable published material is used. The blocks have been lent by the Director General of Archaeology in India, Deccan College, Asia Publishing House, American Anthropologist, and the Department of Archaeology, M. S. University of Baroda. To all these, the author is grateful.

While illustrating the Stone Age tools, tools of the Middle Stone Age which have been recently discovered have been reproduced from several regions with a view to bring out their uniformity as well as distinctive features ; but in the case of the Early and Late Stone Age, only representative types from a few select areas have been illustrated. Illustrations of pottery types have been again very much restricted, because here each site has so many wares and types and sub-types that only a full report devoted to each site can give an adequate idea of the entire range of pottery types. Again a reference to all these reports was not possible, because barring some five or six excavation reports, the rest are unpublished.

It was originally intended to give in the Appendix a section dealing with the various techniques and description of tool-types, and so while detailing the various tool-types, some elementary details which may be necessary from the point of view of the beginner have been omitted. Afterwards, however, it was found that far too many illustrations would be required to illustrate the Appendix, that it should really form a new book. Thus this has been omitted. It is hoped to publish shortly this book entitled *Stone Age Tools : Their Techniques and Functions*.

A detailed bibliography is also not being given at the end of the book, because a full bibliography of Indian prehistory and protohistory is under preparation and it is hoped to publish the same in a short time. At present only a select bibliography has been included.

A work of an all-India character cannot be produced without the co-operation from several quarters—colleagues, friends and pupils. The writer, therefore, would be failing in his duty if he did not acknowledge this in some detail, though he is fully conscious that this is quite inadequate.

To these—Drs. Z. D. Ansari and S. B. Deo and K. D. Banerjee, N. Issac, R. V. Joshi, A. P. Khatri, M. S. Mate, V. N. Misra, G. C. Mohapatra, and G. G. Mujumdar and S. N. Rajguru, Shri R. Singh and the late Dr. B. Subbarao—the writer is indebted in no small measure. Though the various projects of explorations and excavations carried out at the Deccan College were initiated and guided by the writer, still, it was the completion of each of the projects, either singly or jointly, that has contributed to new knowledge. A special further acknowledgement is necessary when it is realised that some of these works are still unpublished and remain in the form of theses or reports under preparation. Every exploration by a pupil has given the author an opportunity to study new sites in different regions of India, such as Bellary, Karnatak, Kurnool, Malwa, Rajputana, Gujarat, the Panjab, Orissa, and Bengal. Thus it is the team work and co-operation which has helped the writer to produce this work.

Outside the Institute, the same co-operation was ungrudgingly extended to him by Shri A. Ghosh, the present Director General of Archaeology in India and

his Officers of the various Circles. Though it would be invidious to single out personalities, mention should be made of Sarvashri N. R. BANERJI, M. N. DESHPANDE, T. N. KHAZANCHI, B. B. LAL, S. R. RAO and B. K. THAPAR. The writer is particularly grateful to the last one for bringing to him the results of his small dig in Orissa and allowing him to use the material. For, this small dig fills in a large gap in our knowledge of the hiatus between the Neolithic and Palaeolithic in Eastern India and promises to be of great significance, if followed up more fully.

To no less a degree the writer is indebted to Shri P. C. DAS GUPTA, Director of Archaeology, Government of West Bengal, for enabling him to visit the site of Rajar Dhipi and keeping him posted about his latest discoveries in the Ajay Valley. The author is also thankful to Professor G. R. SHARMA, Professor of Ancient Indian Culture and Archaeology, University of Allahabad, for similar courtesy shown to him; to Professor K. D. BAJPAI, Professor of Ancient Indian Culture and Archaeology, University of Saugar, for giving him an advance report on his excavations at Eran: to Dr. SATYAPRAKASH, Director of Archaeology and Museums, Government of Rajasthan, and Shri R. C. AGRAWAL, Superintendent of Archaeology and Museums, Government of Rajasthan; to Shri J. M. NANAVATI, Assistant Director of Archaeology, Government of Gujarat and his colleague Shri M. A. DHAKY; Dr. M. SESHADRI, Professor of Indology and Director of Archaeology, Mysore, who was kind enough to show him his finds from T. Narasipur during the exhibition held in Baroda in 1960 and Dr. M. G. DIKSHIT, Reader in Ancient Indian History, University of Nagpur. The author is also thankful to Dr. D. LAL and Professor M. G. K. MENON of the Tata Institute of Fundamental Research, Bombay, for their help in supplying him almost immediately the dates of the charcoal samples from his excavations at Ahar as well as Navdatoli and Nevasa. Likewise he is also indebted to Miss ELIZABETH RALPH of the Applied Science Centre for Archaeology, University of Pennsylvania, U.S.A., for C-14 determinations of samples from Nevasa, Navdatoli and Chandoli.

Considerable indebtedness is due to Dr. GLYN E. DANIEL and to Dr. A H. DANI whose books *A Hundred Years of Archaeology* and *Prehistory and Protohistory in Eastern India* have been extensively utilized for writing the Introduction and Chapter IV, respectively.

Thanks are also due to Dr. MOTICHANDRA, Director of the Prince of Wales Museum, Bombay, who has shown deep interest in this work and has furthered its publication. Finally, I must thank all my colleagues in the Institute who have helped me in preparing the maps and drawings: Sarvashri N. A. KULKARNI, S. K. KULKARNI, P. R. KULKARNI, Y. S. RASAR, H. J. KUMTHEKAR, and R. B. SAPRE. Thanks are also due to Shri K. C. ALEXANDER and Shri M. D. BHANDARE for typing and retyping the matter over and over again.

The author must express his thanks to the authorities of the Bombay University, particularly its Rector, Professor G. D. PARIKH, for kindly agreeing to print the lectures in the size suggested by the author and also agreeing to publish all the illustrations that were deemed necessary. He is also thankful to Shri V. G. MOGHE, Superintendent of Bombay University Press, and Shri B. A. OLKAR, Assistant Superintendent of Publications, University of Bombay, for

their unfailing courtesy and for their willingness to incorporate new matter and illustrations even when the printing work was in progress.

H. D. SANKALIA

Deccan College, POONA,
7th December, 1962.

POST SCRIPT

Since the book was written, an important development has taken place. The First International Conference on Asian Archaeology which met at New Delhi in December 1961 resolved that, that the Stone Age in India be divided *provisionally* into Early Stone Age (or Palaeolithic), Middle Stone Age, and Late Stone Age and the terms "Series II," "Middle Palaeolithic," "Mesolithic" be not used. Though the matter was not fully discussed in the Committee stage for want of time, this direction should be observed to avoid confusion in our discussion. Hence, wherever possible, these terms have been substituted or placed alongside the old ones. For the "Neolithic" no proper term based on culture-economic bases could be found; hence it has been retained, though it is quite unsatisfactory in terms of the known Indian data.

H. D. S.

INTRODUCTION

India and Western Asia

INDIA has been, for the first time in her history, grouped into major linguistic states. Recognition has been given to a slow historical process. But the process was not only historical. It is related to a *certain extent* with the geographical (including the geological) features of the land. These have shaped not only her history, but prehistory and proto-history as well. For, availability of raw material, favourable climatic conditions, easy means of communication etc., have hampered or accelerated the progress of man.

A brief outline of the present set up is necessary for two other reasons: This is directly related to the geographical position of India in relation to Western Asia, and Africa on one side and South-East Asia on the other and to the problem of the origins of civilization.

Routes

India forms a kind of rhomboidal peninsula[1] in the continent of Asia. The north-west-south-east lying Himalayan ranges have given her a certain seclusion from outside influences—both political and cultural as well as climatic, still these ranges have always been penetrated at several times in India's past history. Particularly this has been so in the north-west where the two famous routes—the Khyber and the Bolan Passes to and from Afghanistan and Baluchistan respectively[2]—have let in invaders and refugees, traders and travellers, from Central and Western Asia. Thus the Indian seclusion has been violated. And once the foreigners came in they have spread into the Indo-Gangetic plains and beyond by the most suitable lines of communication.

India is, however, approachable by the sea from the west and from the south and south-east as well by the difficult, hilly and thickly forested country on the north-east. The west has been the major gateway during the historical times, but evidence is now accumulating to suggest that this was so during the prehistoric as well as proto-historic times. And hence scholars like HOLDICH said[3] long before the new discoveries were made that "India had been from time immemorial peopled by immigrants." Likewise, while India undoubtedly influenced the countries of South-East Asia, during historical times, she has also received influences from the same quarters during the Late Stone Age period and after called here 'Neolithic'. All these cultural influences from the west and north-west, east, south-east and north-east did not *at once* nor uniformly spread all over India, but spread gradually, depending upon several factors, among which geographical were the most important.

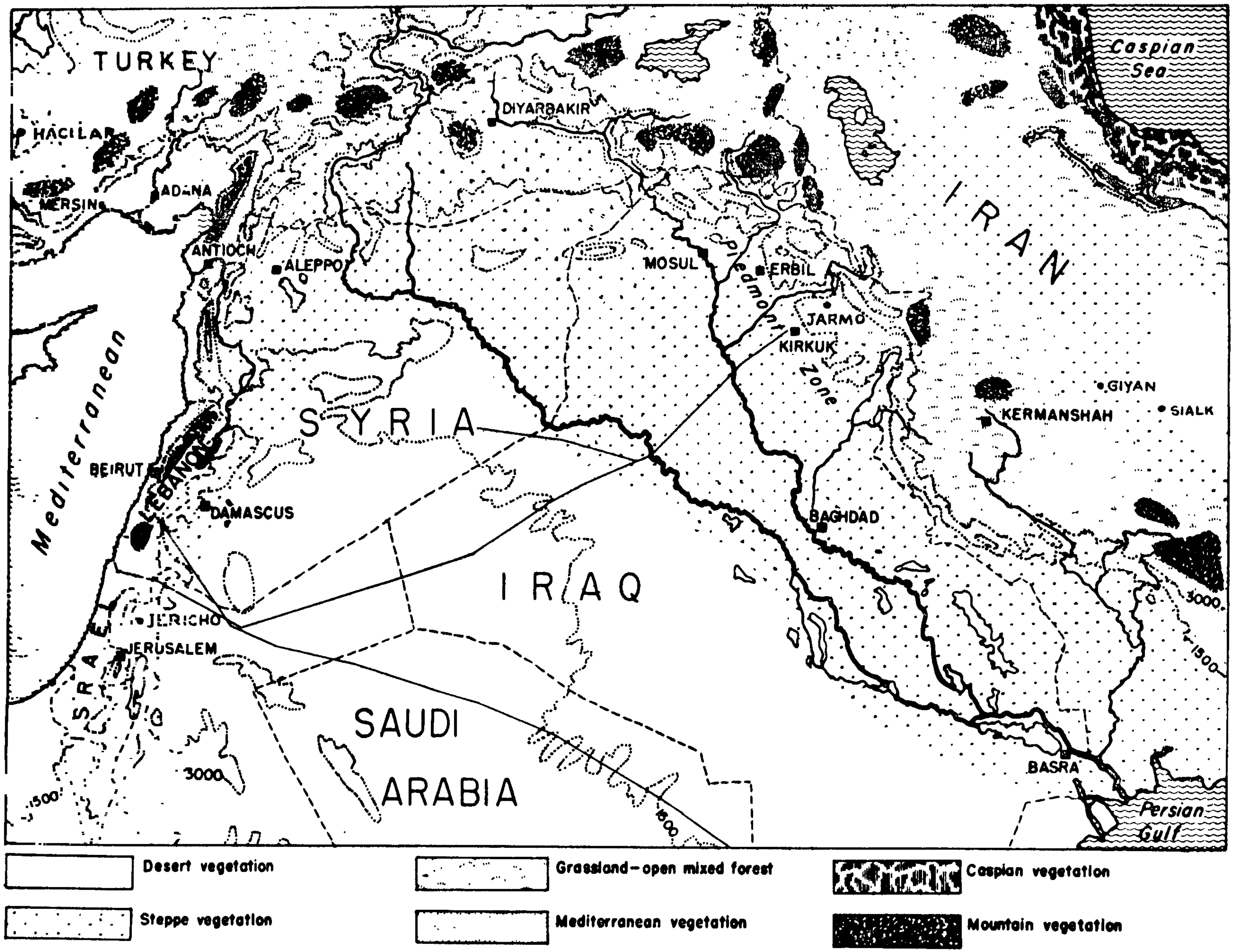
The Fertile Crescent

Now the question arises: "Why should India be always at the receiving end?" Should not have some movements radiated out from India? It has been mentioned above that the role of India as a civilizing influence in historical

1. It is interesting to note (as pointed out by HOLDICH, Colonel Sir THOMAS HUNGERFORD, *India*, 1924, p. 3) that this shape was first defined by the Greek geographer STRABO.

2. Recently FAIRSERVIS has stressed the importance of the Gomel Pass in Afghanistan, *Man*, 1956, p. 156.

3. *Op. cit.*, p. 1.



Map of the "amphitheater," with 1,500- and 3,000-foot contours and indication of the vegetation zones. After Times Atlas I, Pl. 6 (1957). Cf. a rainfall map (e.g. Braidwood, 1952a; Dubertret and Weulersse, 1940; Fisher, 1952).

Fig. 1 Map of the " amphitheatre " in W. Asia, showing four of the earliest sites, *viz.* Jarmo, Jericho, Sialk and Hacilar

times *vis-a-vis* South-East Asia and Central Asia has been amply demonstrated. But with regard to the beginnings of civilization which belong to the realm of of proto-history it is held that the regions of Western Asia such as Mesopotamia, Syria and Iran were more favourably situated for the birth and spread of civilization, particularly, agriculture and domestication of animals. This belt rising in Egypt and passing over Syria, Palestine, Mesopotamia (Iraq) and Iran was called the " Fertile Crescent " by BREASTED.[4]

The discovery of very ancient sites in all the aforesaid countries had strengthened this hypothesis. And in a large number of cases, these civilizations were earlier than the Indus Civilization. Further it could be shown that some at least of the Indus objects were inspired by those of Western Asia.

Though the definition of the " Fertile Crescent " has now been modified by BRAIDWOOD[5] in the light of subsequent research in the Kurdish highlands of Iraq and Iran, still the main hypothesis viz. "that India is situated on the periphery of the cultural spread arising in Western Asia " stands. (*See Fig. 1*).

Diffusion of Civilization

These civilizing forces having entered India either from the north-west and/ or west marched along the main lines of communication, their progress depending upon their inherent vitality as well as on the strength of the opposing natural and man-made forces.

This question of the indigenous origin or the diffusion of civilization to India has now attained a crucial stage becuase 20 years ago one had to account for only one early civilization, confined to a compact geographical area, almost adjoining Western Asia. Now several Chalcolithic cultures falling within the Protohistoric have been brought to light from the Gangetic Valley, Rajasthan, Central India, Saurashtra and the Deccan.

Cul-De-Sac

But having entered India, these cultures or the immigrant people, have not gone beyond. This is supposed to be due to the sea on either side of the peninsular India. Thus the new forces got into a blind road or country—a geographical *cul-de-sac.*

There was also another *cul-de-sac.* Within India, there are even now thickly forested and hilly regions, where primitive, aboriginal tribes are concentrated. It is believed that these people have been driven thither as refugees by the advancing civilizations from outside, from more favourable areas which they once occupied during the Stone Ages.

However, it has not been archaeologically ascertained whether the ancestors of these tribes had not settled there from prehistoric times.[7]

4. This is well reviewed by CHILDE, GORDON, *New Light on the Most Ancient East*, 1958, p. 25.

5. In the *Illustrated London News*, October, 22, 1960, pp. 695-99 ; and BRAIDWOOD and HOWE, *Prehistoric Investigations in Iraqi Kurdistan*, p. 73.

6. HOLDICH, *op. cit*, p. 1.

7. Cf. DANI, A. H., *Prehistory and Proto-history of Eastern India*, p. 4, " But there is no evidence to show that these hill tribes were refugees from the great plains."

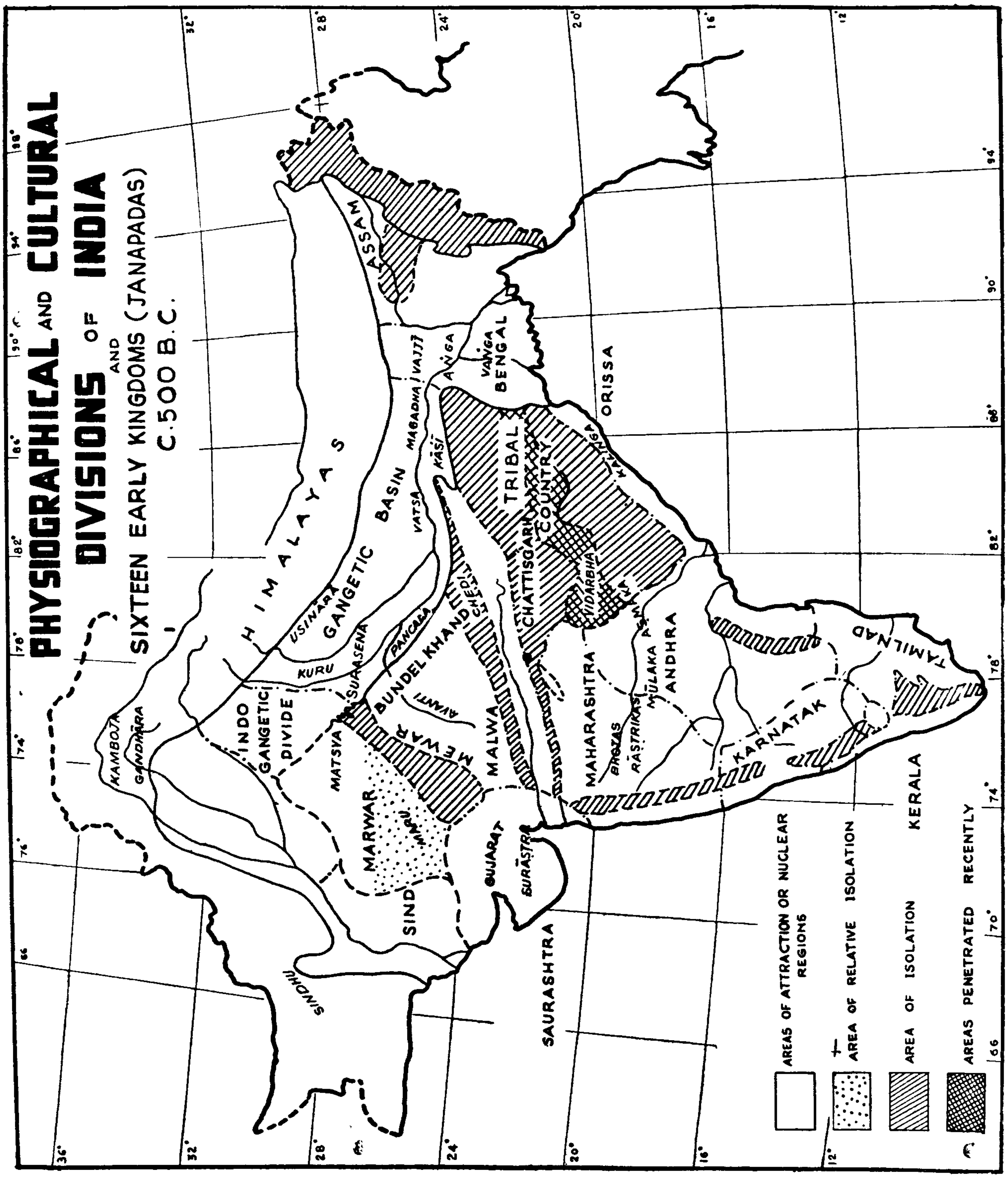


Fig. 2 Early Historical Centres of Civilization and Physiographical Divisio .s of India

Physio-Cultural Divisions

Having thus indicated the position of India in its Asian or continental context, we shall turn to its make up as defined by geography, language and ethnic composition.

Let us first define the areas or regions.[8] (*See Fig. 2*)

1. SIND AND PANJAB

The Indus basin which drains central Himalayas is framed by the Aravallis and the desert of Rajputana in the east and the Sulaiman and Kirthar ranges on the north-west and west respectively. It is further divided by the junction of the hills from the west and the desert in the east into Lower Indus (Sind) and Upper Indus (Panjab) basins. The latter includes (*i*) the sub-montane Indus region comprising the Peshawar and other plains, the Potwar plateau and the Salt-Range. (*ii*) The two Panjabs.

2. U. P., BIHAR AND BENGAL

The Ganges basin is likewise divisible into (*a*) Indo-Gangetic Divide or the Upper Ganges Plain, (*b*) the Middle Ganges Plain and the Deltaic region. These respectively constitute the Delhi, South Panjab, Uttar Pradesh, Bihar and Bengal. Towards the south-east and south, the Gangetic plain abuts on the old Peninsular landmass and thus all these three states share its prehistory.

3. ASSAM

Further eastwards the Brahmaputra Valley forms Assam. But geomorphologically Assam consists of three entirely different regions belonging to three structural formations, the Himalayan frontier; the main Assam or Brahmaputra Valley which is an extension of the Indo-Gangetic trough and the Shillong Plateau which essentially belongs to the older peninsula. (*See Fig. 113*)

4. MADHYA PRADESH

Bounded by the Aravallis in the west, the athwart lying Vindhyas in the south and the Ganga-Yamuna doab in the east-north-east is the Malwa Plateau and Bundelkand. Its southern portion is built up by the Deccan Lavas; but the north has a varied composition. On the west and north it is drained by the Banas, Chambal, Sipra and their tributaries; in the south by the Narbada, in the east by the Son and south-east by the upper courses of the Ken and the Betwa.

5. MAHARASHTRA

South of the Vindhyas is Maharashtra, its limits almost co-extensive with the Deccan lavas. It includes three or four former cultural units, Khandesh,

8. SPATE, O. H. K., *India and Pakistan* (London 1954). He gives a very detailed regional division (pp. 352-61 and fig. 62) which for the present purpose is unnecessary. SPATE's remarks on the difficulties of a proper division are worth reading. And, SUBBARAO, B., *The Personality of India* (Baroda, 1958), p. 16 and fig. 6. SUBBARAO's sketchy picture is here amplified wherever necessary.

Desh or Western Maharashtra, Vidarbha and Konkan. The most important drainages are the Tapi-Purna, Wardha-Vainganga and the upper Krishna-Godavari, whereas the Konkan which is a narrow strip of coastal plain is drained by numerous fast-flowing streams.

6. Andhra

Andhra is mostly constituted by the middle and lower basins of the Krishna and Godavari, which flow through some of the oldest rock formations in India.

7. Karnatak or Mysore Plateau

This is a sort of triangle formed by the Eastern and Western Ghats. Through the upper flow the Krishna and its tributaries; the Tungabhadra, Hageri, upper Pennar and Kaveri constitute the main drainage of the lower.

8. Kerala

Likewise, the still narrower coastal plain on either side of the Palghat gap in the Western Ghat is Malabar or Kerala. It is drained principally by the Periyar and the Pampa.

9. Tamilnad

This is believed to be a simple coastal belt, but as Spate has shown, it is not so simple as that. It is a great quadrant, lying between the sea and the Deccan Plateau. The coastal plain proper extends from the Krishna to the Cape. But this is broken by the Kaveri delta. Inland are the discontinuous Tamilnad hills. In fact, the whole region is capable of six sub-divisions, though here it is treated as one. Its major rivers are the Pennar, Palar, Pennaiyar, Kaveri and the Vaigai.

10. Orissa

Orissa, ancient Utkal, is also regarded as an emergent low-land, but like the Tamilnad consists of the deltas of the Mahanadi, Brahmani and Vaitarni, a zone of older alluvium, and laterite plateaus and hills on the west, which form part of the Indian landmass.

11 Gujarat

Gujarat consists of three distinct units—Kutch, Saurashtra and Gujarat. While the first is mostly marshy, and sandy, but having a rocky core, the great mass of Saurashtra is formed by the Deccan lavas, the rest by earlier sandstone rocks, while the coast is made by the recent alluvium. It is probable that not long ago Saurashtra was an island.

The major rivers of Saurashtra are the Bhadar and the Shetrunji. The basin of the former is considered the richest agricultural area, the other favoured regions being the Gohilwad low-land along the Nal depression and Sorath, a portion of south-west Saurashtra.

Gujarat proper has three zones : the purely coastal belt of Southern and Central Gujarat, then the large tract formed by the eolian sand and alluvium (old and new) formed by the Sabarmati, Mahi and other smaller, parallel flowing streams and the easternmost hilly and jungle country which forms, as it were, a bridge between Malwa, Gujarat and Rajputana.

12 Rajputana (Rajasthan)

Rajputana is made up of two natural divisions : Mewar and Marwar. The country to the west of the Aravallis is mostly sandy and covered by scrubby, stunted acacias, while the eastern part is more hilly, less sandy and fertile. It is being increasingly felt that much of Western Rajputana was formerly a sea. The latter as well as the eastern part of Bikaner drained by the ancient Sarasvati and Drishadvati is built up by the Gangetic-like alluvium.[9] The Banas is the major river of Mewar. It later joins the Chambal which falls into the Gangetic basin. The Luni is the only river of some consequence in Marwar.

13 Hilly and Forested area

These areas are interposed or intersected by three or four hilly and forest regions. viz. (*i*) the great Central Indian belt where several rock formations, the Satpuras, Vindhyas, Maikal, Chota Nagpur and Orissan meet ; primeval forests still flourish in parts of Malwa, Khandesh, Central Provinces (M.P.), Chattisgarh, Chota Nagpur, Andhra and Orissa. This almost forms a solid continuous block in the heart of India.[10] Here reside the Bhils, Dangs, Gonds, Santhals, Uraons, Gadabas, Marias, Savaras and many others. (*ii*) Likewise the Aravallis still harbour the Bhils, (*iii*) while along the Western Ghats we have the Warlis, Thakurs, Dhanagars and further south in the Nilgiris Todas, Kurumbars and others. (*iv*) The discontinuous Eastern Ghats in the present Andhra State are the home of the Baigas, Chenchus, Reddis, Savaras and others.

Attraction and Isolation

Among the physio-cultural regions, Subbarao regards (*i*) the Panjab, the Indo-Gangetic Divide, Gangetic Basin, Bengal, Malwa, Maharashtra, Karnatak, Tamilnad as " Areas of Attraction or Nuclear Regions; " (2) Sind, Marwar, Gujarat, Saurashtra, Konkan, Kerala, Assam, as " Areas of Relative Isolation " and (3) the Aravallis, the Central Indian highlands and forests, as well as similar areas in Andhra as " Areas of Isolation or *cul-de-sac*."

While there is no difficulty in fully accepting[11] the last category or group, there is considerable difference of opinion about the first two groups. For, Spate includes among the nuclear regions Gujarat, and Saurashtra, and Kerala or Malabar, among others in the south.

The main grounds of difference between Spate and Subbarao are that whereas to the former—the nuclear regions—represent the major agricultural

9. This is writer's observation.

10. This can best be seen in the map No. 23 of *National Atlas of India* (in Hindi), Calcutta—Dehra-Dun, 1957.

11. Though even here it is necessary to prove by archaeological excavations, as Haimendorf suggested over 10 years ago, that these primitive tribes are comparatively recent arrivals in the area, and not residing there from time immemorial.

areas which have been "perennially significant in Indian historical geography," to the latter, following RICHARDS[12] besides the agricultural potential, relation of the region to the main continental highways is also a major consideration. Since, from SUBBARAO's point of view, Sind, Saurashtra, Gujarat and even Kerala are situated away from the highways, these are areas of semi-isolation.

This may be. However, these areas are not truly isolated or even semi-isolated. The Indus Valley (besides being more fertile) and the entire west coast are open to direct contact with Western Asia and beyond with the Mediterranean countries. Hence throughout (even during the Early Stone Ages according to WHEELER) the protohistoric and historic times, developments in Western Asia have sooner or later reached India. And in fact, as will be seen in the sequel, Sind, Saurashtra, Gujarat and even Rajasthan show the earliest traces of civilization, including urbanization.

Civilization and Environment

We are thus up against the exact role of geography and environmental factors in the development of civilization. Without going into much details, it is necessary to point out that even in the West, where formerly the "Fertile Crescent" was regarded as the cradle of civilization, now the hilly flanks characterized by the foothills and intermontane valleys at an elevation of 1250 to 3000 ft. above sea level in Iraqi Kurdistan are regarded as such. Here it appears that transition took place from the earlier food-gathering pattern of life to that of food production. For here more than anywhere else "the wild wheats and barley, the wild sheep, goats, pigs, cattle and horses were to be found in a single natural environment."

However, after this was written, investigations are being continued in Iran. And it was found[13] that such a zone of grassy and open oakland ran from Shiraz in Iran through highland Iraq and southern flanks of Turkey—a distance of some 12,00 miles. Hence BRAIDWOOD concluded, "It continues to appear that the more important generative factors in the appearance of effective plant and animal domestication are not to be sought in the facile explanation of environmental determinism."

He further said that Jarmo or any other site examined by them was not in any way a unique instance in time and place wherein food production began. These were sites which happened to be those which the accident of archaeological discovery had brought forth.[14]

These revised views of an author who believed only a few years ago in a particular site in a particular area as the birth place of civilization are quite *relavent* to the problem we are discussing.

Though India appears to be on the periphery of the culture spread in relation to Western Asia, and within India itself the present distribution of forests

12. RICHARDS, F. J., "Geographical Factors in Indian Archaeology", *Indian Antiquary*, Vol. LXII (1933), pp. 235-43.

13. BRAIDWOOD, in *Illustrated London News*, October, 22, 1960, pp. 695-97.

14. *Cf.* also WRIGHT (In BRAIDWOOD and HOWE), *Prehistoric Investigations in Iraqi Kurdistan*, p. 73, "speculation about the effects of climatic change on the inception of agriculture is justified only after the fact of climatic change has been established" and this must be based on geological evidence,

and the gradual removal of forest-cover from Sind, the Panjab, Saurashtra, Malwa, Uttar Pradesh (as even attested by literary evidence, for instance the burning of Khandavavana, the home of Nagas, for building the new capital of the Pandavas—Indraprastha—is vividly described in the *Mahabharata*) the concentration of primitive tribes in certain inaccesible forests and hills, and above all the increasing archaeological evidence—though all this points to the spread of civilization from west to east, *still it cannot be over-emphasized that our knowledge is relative, based on insufficient evidence* (*in some cases no evidence at all*) and the fact that there is no unanimity among the archaeologists themselves whether the various Chalcolithic cultures which appear in the wake of the destruction or disappearance or gradual transformation of the Indus Civilization are purely indigenous or introduced (again) by movements and ideas from Western Asia.

Prehistoric archaeology in India is thus called upon to answer very vital questions. Let us see how far it has done so. However, with a view to following the sequel, let us define clearly the aims and scope of pre- and proto-historic archaeology and indicate its present position in India and Europe, of which it is an off-shoot.

Prehistory

Prehistory means the history of a region, a country or a nation, people or race, before it took to or knew writing. This, like ordinary history, is not based on accounts of contemporary or later writers. Hence prehistory is also defined as an account of illiterate or preliterate people.

How is then the history of such an illiterate people or country known ? What are or can be its sources ? In brief, anything that tells us its past history : language, place-names and study of the people's physical features, customs and manners, legends and traditions, their monuments; even a study of landforms, soil and vegetation and the animals may help to illustrate this story. Of all these several sources—language and linguistics, ethnography and ethnology, geography, geology, physical anthropology, flora and fauna, we are here concerned with archaeology alone.

Archaeology

Archaeology means study of antiquities. These antiquities may belong to a historical period and thus fall into the sphere of historical archaeology. Others to a period beyond that. This earlier-than-history period is generally called pre-history and it suits well such countries as Africa, Australia and even England, France and Germany, for example, where except for some legends and traditions there was no systematic body of oral tradition or literature. India forms a major exception to this general notion. Here, though no regular, written accounts are available until the middle of the third century B.C., still it has a well developed literature—the Vedic and Sutra—the earliest of which easily goes back to 1,500 B.C. This literature can and has been a source of Indian history. But since it is (was) not written down, it is called here Proto-history.

Proto-History

Likewise, the Indus Valley or Harappa Civilization, though included by some writers under Prehistory, should and is here included under proto-history.

For, firstly, their authors were not illiterate, as amply demonstrated by their seals, and it is not their fault if we cannot decipher their script. Secondly, this civilization is one of the sources of the later-day Brahmanism and Hinduism. In a twofold way, thus, Indus Civilization is protohistoric for us. By this definition proto-history in India would also comprise the various Chalcolithic cultures which were contemporary with and very often immediate successors of the Indus Civilization. Their exact geographical scope and time range will be pointed out later.

Prehistoric Archaeology then will deal with that period of time in India of which we have no legend, no tradition and no object, save stone (and bone) implements and remains of animals. This is not a very precise definition, but will, I find, serve our purpose. Briefly, then, prehistoric archaeology will comprise the various Stone Ages.

History of Prehistoric Archaeology

The study of the Stone Ages is now over 100 years old in India, almost of the same age as in Western Europe and England. In these countries a suitable atmosphere was created around 1850 for the foundation of prehistoric archaeology. Though the interest in old objects—antiquarianism—was quite old, and though occasional discoveries of Stone Age tools had been reported from England and Germany as far back as 1715 and 1771 respectively,[15] very few scholars including geologists were prepared to accept that the world was much older than 4,004 B.C. according to the interpretation of Old Testament.[16] The geologists then believed that the various rock formations on the earth were not due to certain set principles, but sudden catastrophies. Hence the earlier discoveries of stone tools in association with bones of extinct animals went either unnoticed or were looked upon with suspicion.

Geology

Then CHARLES LYELL (1797-1875) propounded [17] the theory that rocks of a similar nature were developed or laid out in an identical way all over the earth. This is called the theory of uniformitarianism. The theory did not find a ready response or acceptance among all. Its recognition was also slow in an intellectual and social world steeped in Biblical theory of the Deluge.

However, it facilitated the understanding and the ready acknowledgement by some of the most prominent British geologists—JOHN EVANS, FALCONER, LYELL, PRESTWICH, PENGELLY—of the significance of the discovery of stone tools (hand axes) in association with fossil animal bones deep down in the cliff over the Somme river at Abbeville in France by BOUCHER de PERTHES in 1836, and of the discovery, under the direct supervision of PENGELLY in a cave at Brixham, South Devon, in England in 1853.

15. See, DANIEL, GLYN, *A Hundred Years of Archaeology*, (London, 1950), p. 27. This is a most informative book and has been used in reviewing the development in Europe.

16. This was the view (interpretation) of Archbishop USSHER and was printed in the margins of the authorized version of the Bible. Bishop LIGHTFOOT calculated the exact time to be 9 a.m., 23rd October, 4004 B.C., whereas DR. MARGARET MURRAY has suggested 6 p.m. on Wednesday, March, 21, 4004, B.C. in *Antiquity*, 1961, p. 8.

17. In his *Principles of Geology* (1830-33). DANIEL, *op. cit.*, p. 38.

Environmental Archaeology

These discoveries proved beyond doubt that man, the maker of stone tools, and the associated animals—such as lion, elephant, rhinoceros, ox, belonged to a time and clime which were not only of hoary antiquity but belonged to a time when Europe was much different climatically and to some extent geographically. Thus the new disciplines of palaeogeography, palaeobotany, palaeoclimatology—what is now called " Environmental Archaeology "—were slowly being ushered in, though their regular establishment in Universities was much later.

Evolution of Man

The discovery of the skeletal remains of man himself (as distinguished from his tools) was not far to come. Already a human skull had been found in 1700, but went unnoticed. Then a skull was unearthed at Neanderthal on the river Dussel in Germany in 1857.[18]

This has later been recognized as the species of an extinct type of man known as Neanderthal Man. This man had high brow ridges and backward sloping dome of the skull and was regarded as " the most ape-like " by HUXLEY.

So everything—tools, extinct animals and man—were there to disprove the beginning of Earth only some 5000 years ago. A scientific explanation was necessary to understand their relationship. This was provided by Charles DARWIN[19] and HUXLEY.[20]

A new point of view was now given for looking at these momentous discoveries.

Foundation of Museums

Though the British Museum had been founded in the 18th century, it was the Danish archaeologists who thought of and founded a museum of antiquities, classified them on some principles and later tried to explain the bases of similarity and difference by reference to tradition, comparative methods and ethnography. Thus between 1800—1850, they had laid down the real foundation of prehistoric archaeology. The outstanding names in this movement were RASMUS NYERUP, VEDEL-SIMONSEN, CHRISTIAN JURGENSEN THOMSEN, SVEN NILSSON and J. J. A. WORSAAE. NYERUP advocated the formation of a National Museum of Danish Antiquities in 1806, but was unable to classify the small collection of antiquities he had made at the University of Copenhagen. This was achieved by THOMSEN, developing the notion of Three Ages first set out by VEDEL-SIMONSEN in 1813. THOMSEN, as first Curator of the National Museum of Denmark " arranged his collections by classifying into three ages of Stone, Bronze and Iron as the basis of the material used in making weapons and implements. " The specimens were divided into three groups as they represented, according to THOMSEN, three chronologically successive ages.

18. For this and other earlier discoveries see DANIEL, *A Hundred Years of Archaeology*, p. 35.
19. *Origin of Species* (1859) and *The Descent of Man* (1871).
20. *Man's Place in Nature* (1863).

Three Ages

In spite of several fundamental changes, in the Three Age conception, the basic idea has remained, viz. that originally man did not know copper or iron, and used implements of stone alone. Then came the knowledge of copper and still later of iron.

However, it was never maintained by THOMSEN or his pupil WORSAAE that the concept of the Three Ages implied a straight forward evolution or development from one technological stage to another. They were aware of the breaks in development, as well as of the causes, such as invasion, diffusion of new ideas and migration of people which might have brought about new knowledge of copper and iron. It was NILSSON who declared the exact role of prehistoric archaeology. " It demonstrated that " he said, " notwithstanding apparent or partial retrogression the human race was constantly undergoing a gradual and progressive development."

Prehistory thus is a study of man's material (as well as moral and spiritual) progress. And these Scandinavian scholars were not merely content with the formulation of the Three Age theory: they stressed the need for accurate description and classification of antiquities and the value of tradition and comparative methods in the interpretation of the use of antiquities.

This enabled NILSSON to distinguish four stages in the development of man : (1) The Savage Stage (2) Huntsman or Nomad (3) Agriculturist (4) Civilization (on the basis of coined money, writing and the division of labour). Herein we find the seeds of the later development in the conception of the Three Ages by anthropologists and archaeologists and students of human geography. NILSSON did not equate the subsistence classification of man with the ages of stone, bronze and iron.

Enough was done by THOMSEN, WORSAAE and NILSSON to chalk out the road on which prehistoric archaeology was to proceed. Subsequent scholars by splitting up the Stone Age into Palaeolithic, Mesolithic and Neolithic, and dividing still further the first into two or three periods, as knowledge grew, or redefining the Three Age concept as technological stages and associating with each stage the economic and social status of man, have merely incorporated the new ideas which have dominated the world since the Russian Revolution. Even the great interest in Denmark's past, WORSAAE attributed to the French Revolution, for, " with a greater respect for the political rights of the people, there awakened in the nations themselves a deeper interest in their own history, language and nationality."

First the prehistorians had to expand the Three Ages into Four : Palaeolithic, Neolithic, Copper and Iron. Later, as discovery followed discovery, the first was split up into three sub-divisions : Lower Palaeolothic, Middle Palaeolithic and Upper Palaeolithic and so also others. The initiator was Lord AVEBURY (formerly Sir JOHN LUBBOCK). His lead was followed by LARTET, de MORTILLET and MONTELIUS and the various chronological frameworks of prehistory so developed were adopted by the leading writers, until drastic changes were proposed by the Abbe BREUIL. LARTET for the first time put forward a classification of archaeological material from the various French caves on the

palaeontological data. He thus respectively distinguished four periods according to the occurrence of such animals as the Bison, the Reindeer, the Wooly Mammoth and the Cave Bear.

Palaeontology and Archaeology

De MORTILLET went a step further. Combining this basis of classification with the archaeological, he divided the whole development into *Times, Ages, Periods* and *Epochs*. Tertiary, Quaternary, Recent, Prehistory, Protohistory and History were the broad divisions of Time ; the Ages were those of Stone, Bronze and Iron, and the Periods Eolithic, Palaeolothic and Neolithic, and the Epochs were the smaller divisions of each Period.

His epochs such as the Chellean, Acheulian, Solutrean which were after the local French sites were supposed to indicate small periods in human history when man used only Chellean types of tools. Such an extension of a purely local French cultural manifestation into other areas in France or to other countries of Europe was not justified. For it implied parallel or synchronous development of cultures all over the world.

This concept vitiated the principle of regional and geographical differences, which was then discovered by students of human geography and cultural anthropologists. It has now been realized that not only one has to provide for varying human needs and development on broad regional bases, but the same locality—for instance a site in South of France[21] or in England[22]—may exhibit different cultural relics according to the seasonal climatic changes[23] and one may even talk of " summer and winter archaeology ". Thus the former (new) theories about separate but parallel existence of Flake Cultures and Core Cultures are under scrutiny and it is quite possible that this view will be soon abandoned.

New connotations of the Three Age system were advocated by culture historians and anthropologists. When new types of tools etc. were found in different associations, the differences were sought to be explained by the arrival of new people or ideas. And at times these supposed new arrivals were named after the site, or from tradition or given well-known racial names. This identification of a prehistoric industry or culture with this or that race or people is extremely hazardous. At best, the name of the type-site might be given—such as " Harappan " after Harappa. The diffusionist theory did one good. It gave a blow to the epochal theory of de MORTILLET of parallel and uniform development all over the world.

But if we now ask " when was it that man began to produce his own food, that is, learnt cultivating grains and fruit and ceased to be a hunter and nomad, living on wild fruits, vegetables and game?" can we demarcate the stages and correlate them with chronological development as envisaged by archaeology ?

Economic Bases

It may be recalled that WORSAAE had thought of dividing human history on the basis of subsistence, but not taken the further step in equating them with

21. See BORDES in *Proceedings of the Prehistoric Society* for 1956, New Series, Vol. XXII, 1957, p. 5.
22. CLARK, J.G.D., *Excavations at Starr Car*, Cambridge, 1954.
23. CLARK, GRAHAME, *Archaeology and Society*, London, 1957.

the archaeological data. It was ELLIOT SMITH who first divided human history into two stages : The first of food-gathering and the second of food-production. The idea was later developed by a number of scholars, amongst whom the late Professor GORDON CHILDE might be described as the most outstanding.

The emergence of man from the state of food-collector to that of food-producer, is characterized as the First Revolution in human history. The second was the Urban Revolution. This again took place in prehistoric times, when with the discovery of metals—copper and its alloys—there was specialization in labour, regular foreign trade, surplus wealth and ultimately a city. Of course, all this was a very, very slow process. Mere discovery of the metals, or its import from a distant place, as our own excavations in Central India and the Deccan show, did not immediately bring about a change in the life of the people. Notable, however, is the inherent change in the way of life.

Technological Stages

CHILDE[24] later came forward with another suggestion, viz. that the various ages : Palaeolithic, Neolithic, Copper and Iron, were not chronological ages, but technological stages. That is, no longer should the terms " Neolithic " etc. denote a particular period in human history ; they should merely indicate the stage in which human beings in a particular region or country are. Thus if the Australian aboriginals are called " Palaeolithic " or " Neolithic ", it means only that these people have learnt the art of making stone implements in the way we associate with these " ages ", but they did not necessarily belong to the hoary past.

CHILDE further advised us, after HUXLEY nearly a century ago, to regard the Ages as " homotaxial ", but not as synchronous. That is, it is possible that the same types of tools or assemblages of fossils follow one another in the same order all over the world, but this does not imply that these (tools) must everywhere occupy the same position if aligned according to the series of solar years. Thus we can express this mutual relationship by the term "homotaxial" and avoid the implication of parallel development all over the globe.

Relative Chronology

It is also now customary to employ relative stratigraphy for dating purposes. For instance, the Chalcolithic deposits at Navdatoli (NVT) on the Narbada opposite Maheshwar, Nimad District could be divided into four sub-periods on stratigraphical grounds, as NVT_1, NVT_2, NVT_3, NVT_4. Now pottery similar to NVT_2, may occur at Nevasa, some 200 miles southwards, in the Deccan. Then Nevasa Chalcolithic Culture could be assigned this age. This is no doubt relative dating, but when NVT_2 has an absolute date based on C-14 method, then Nevasa could have the benefit of this carbon-dating.

Discoveries in Western Asia

Further demonstration of the truth of the Three Age theory was provided by startling discoveries in Egypt, Mesopotamia, Anatolia and Crete. Of course, the earlier work in all these countries, particularly Egypt and Mesopotamia, was

24. GORDON CHILDE, V., in *JRAI*, Vol. LXXIV, 1944, p. 7.

far from scientific and nothing less than loot and pillage. Neverthless, the antiquities, large and small, magnificent sculptures, tools and weapons of copper and bronze and jewellery and the buildings from which they were somehow unearthed, struck the European world with awe. Realization that the East had seen better days than Europe in the past began to dawn upon the scholars and the common man. Its antiquity was proved when CHAMPOLLION and others deciphered the hieroglyphic script of Egypt and RAWLINSON read the cuneiform and Old Persian.

All this helped in bridging the gulf between the Stone Ages and the historical period.

Later discoveries in this century are proving the truth of various Biblical accounts [25] and even those of the mythical kings and dynasties mentioned in the king-lists of Mesopotamia. Judged by the test of the existence of writing, the history of countries like Iran, Egypt, Palestine, Syria, Turkey, Greece and Crete, is stretched much farther back. What was once believed to be prehistory has now come into the range of history. Thus both in Egypt and Mesopotamia history commences around 3,000 B.C. So will it be in India (or Sind and the Panjab and Saurashtra and Rajasthan) when the Indus script is deciphered. Hence the period prior to 3,000 B.C. and upto about 5,000 B.C. may be called Protohistory. For during this interval of 2,000 years or so (it indeed varies from region to region or country to country) many of the essentials of the historical period were being formulated or taking shape. Towns or villages, agriculture, metallurgy (though often rudimentary), monumental architecture, pottery and other crafts were all there—only the knowledge of writing [26] (literacy in the modern sense !) was absent.

Human History

Prehistoric archaeology has no longer remained a simple collection of antiquities, nor a study and classification of artifacts of the dim past. Whether a person is an archaeologist or anthropologist or geologist, or a culture historian, ultimately it is the human history to which one has to aim at in interpreting the artifact.

This has necessitated the help of so many collateral disciplines. Though founded on geology, it has been nurtured by palaeontology—a specialized branch of geology—botany, anthropology, ethnology, history and the latest developments in chemistry and physics.

Prehistory in India

Prehistory in India began none too late. The first tool—a ground or polished stone axe was found by MEADOWS TAYLOR at Lingsugur in 1842, though ROBERT BRUCE FOOTE discovered the first palaeolith at Pallavaram near Madras in 1863 ; so did BALL in 1875 at some four sites in Orissa and HACKETT at Bhutra on the Narmada in 1873 and WYNNE at Mungi-Paithan on the Godavari in 1865 and COCKBURN in the Singrauli basin, South Mirzapur, in 1883. COCK-

25. ALBRIGHT, *Archeology and the Bible.*

26. After the discovery of the oldest town-wall at Jericho in Palestine, Sir MORTIMER WHEELER finds this condition as arbitrary.

burn's, HACKETT's and WYNNE's finds were associated with extinct animal bones.

But except FOOTE nobody systematically carried on the search. Whereas sporadic discoveries continued to be made, he alone for nearly 40 years explored the rivers of Madras, Andhra, Mysore, Karnatak and Gujarat, while attending to his main work as consulting geologist. Not only he amassed a vast collection, but classified and catalogued it. This has been published by the Madras Museum. Thus FOOTE combined in himself the work of THOMSEN, WORSAAE and BOUCHER de PERTHES. He was the true pioneer of Indian Prehistory.

Unfortunately his work was not followed up, either by the Department of Archaeology or by the Universities. It was indeed sad, but in truth nobody was to be blamed. Though in India we were not shackled by the Biblical notion of the antiquity of the world, the political, social and cultural atmosphere which had manifested itself in Europe was completely absent in India. Therefore these early discoveries did not take root.

Indian Cosmogony

Every religion in India, whether it be Hindu (Brahmanical), Buddhist or Jain had its theory of cosmogony. Unlike the Christian, they regarded the world as of inconceivable antiquity (*anadi*). However, its history could be divided into four ages : *Satya*, *Treta*, *Dvapara* and *Kali*, during which the world gradually deteriorated from all truth and happiness—the Golden Age[27]— to untruth and misery. We are now in the last.

Then later, about the 4th century A.D. developed the theory of the *avataras* (incarnations) of the god, beginning with that of the Fish and ending with the emergence of " Full Man ". This theory reminds us of the biological evolution of man.

Birth of Civilization

The Jains and the Brahmins also speculated and in one of the later accounts of the world's development, accidently hit upon the birth of civilization as now envisaged by archaeology These are briefly cited here.

A Jaina tradition preserved by Puṣpadanta, the author of the *Mahāpurāṇa* (in Apabhraṁṣa) while commenting on the statement of a much earlier work called *Kalpasūtra* says that before the king Nābhi there were kalpavṛikṣas (wish-fulfilling trees), and so people could get what they liked. But during Nābhi's reign, these trees had disappeared. There was the first rainy season, but people did not know how to till and how to collect grains and so were starving. When this was the state of the people, Nābhi taught them to make earthen pots out of the temples of the elephant. He taught them to crush the grain with a *pestle*, to enkindle fire and to cook. He explained them the method of drawing a thread out of cotton and weaving cloth. Thus Nābhi and his son Ṛisabhadeva were not only the first teachers of Jainism, but from the point of view we are discussing here, the bestowers of civilization.[28]

27. This conception may be compared with those of the Greeks preserved by HESIOD. He had envisaged five stages : (1) The Age of Gold and Immortals; (2) The Age of Silver, when man was less noble by far; (3) The Age of Bronze, when not only everything was of bronze, but when man was delighted in war ; (4) The Age of Epic Heroes and (5) The Age of Iron and Dread Sorrow. Later the Roman author Lucretius had also put forward a semi-philosophical, semi-materialistic scheme, according to which man first used his nails,teeth, bones, wood and fire, then copper and still later iron. DANIEL, *A Hundred Years of Archaeology*, pp. 16-7.

28. For details see, SANKALIA, H. D., " Ṛsabha or Ādinātha " in *Jaina Antiquary*, 1957, p. 82.

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Chapter I

LOWER PALAEOLITHIC CULTURE

EARLY STONE AGE

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In the Hindu or Brahmanic mythology, Pṛithu, (said to be ruling the Gaṅgā-Yamunā doab) son of King Vena, is credited with the introduction of an agricultural and urban way of life by founding towns and villages and even mining. He is said to have achieved this feat by first "flattening" the earth, so as to facilitate agriculture, storage of water and building of houses. Hence the earth is called "*pṛithvī*", after Prithu. See *Shrīmad Bhāgavat Purāṇa, IV. 18.* (Gujarati Edition published by M. T. TELIWALA, Bombay, 1934, p. 149.)

Antiquarianism Absent

All this should have goaded the people in India to take interest in antiquities. But this was never done. The Hindu mind was turned towards the metaphysical aspect of these questions and later—when images had come into existence—it was considered a sin to worship or even preserve an image which was (somehow) broken. Thus antiquarianism and true historiography never developed in India. There was not even simple curiosity to know the past.

New Impetus

Whatever interest we behold today is solely due to the impact of Western thought and science. So after FOOTE, it took nearly three decades to revive interest in Indian prehistory and another decade to arouse the official world—the Archaeological Survey of India—and still another fifteen years for its establishment there.

It began with the work of CAMMIADE and RICHARDS, two British-Indian Civilians. These during their tours in present Andhra and Madras States had collected thousands of palaeoliths and other stone tools. These were studied by BURKITT who proposed a climatic and typological correlation with that of Africa.

Yale-Cambridge Expedition

Indian prehistory was thus re-born in 1930. It took a great step forward when the Yale-Cambridge Expedition under the leadership of De TERRA, after prolonged geological, climatic, botanical and palaeontological study of the Kashmir Valley, the Panjab (the Potwar Plateau), the Narbada Valley at Hoshangabad and the Kortalayar near Madras published the results. This was the first systematic and scientific attempt to put prehistory on a proper foundation.

Indian Universities

Soon after a modest beginning was made by a few Universities. The Calcutta University dug the laterite gravels in Mayurbhanj, Orissa. The Archaeological Survey, Government of India, in co-operation with the Deccan College Post-graduate and Research Institute and the Gujarat Research Society, Bombay, took up the clues in Gujarat left by ROBERT BRUCE FOOTE 50 years earlier. This stimulus given by the late Rao Bahadur K. N. Dikshit, has continued to inspire all subsequent work in India. A few more Universities—Baroda, Mysore and Allahabad—besides that of Poona and Calcutta, have entered the field. The Government of India have created a regular sub-department of prehistory in the Department of Archaeology, once again renamed Archaeological Survey of India.

Official and academic recognition has thus been accorded to prehistory. The press is spreading the news of progress in the subject to the literate.

However, there is not that social awareness and interest in the subject to strike deep roots. Probably this is due to mass illiteracy and poverty, and apathy of the intellectual classes to things of the past.

Beginning of Protohistory

Surprisingly nobody had thought of a systematic search for tracing the beginnings of the historic archaeology in India. So for nearly 70 years—from 1860 to 1920—work continued in the historic field, until the Indus Civilization was revealed in 1917-20. For a long time it was assumed to be pre-historic, but it is now realized that several of its features entitle it to be called "Protohistoric." Though systematic attempts were made soon after its discovery to understand its spread and extent by N. G. MAJUMDAR, Sir AUREL STEIN and HARGREAVES, its origin remains obscure. The problem was freshly attacked by Dr. (now Sir) MORTIMER WHEELER in 1947 at Harappa and then at Mohenjodaro and significant details have been added to our knowledge of the civilization. To this a new chapter is being added by Shri S. R. RAO's work at Lothal.

Meanwhile, the work of the Universities and the Government of India and the State Departments has brought to light hitherto unknown cultures in the Gangetic Valley, Rajputana, Saurashtra, Central India, the Deccan and Mysore. These are often called "prehistoric," but are truly "protohistoric," as is understood here.

We may say, then, that the real foundations of pre- and proto-historic archaeology in India were laid between 1920 and 1930. It has since then flourished after the Second World War.

Work Ahead

Both have still much to achieve. So far a mere skeleton sequence of cultures has been obtained in prehistory and protohistory, but the whole sociological background is missing. In the former the old techniques are to be perfected and new onces adopted. We are far behind Europe and America and even Africa in this respect. Not only are the latest scientific methods of dating the river and other deposits—called geochronology—suitable to Indian conditions are to be learnt and applied assiduously, but attempts must be made to understand the distribution of hand-axe and other prehistoric as well as protohistoric cultures on an ecological basis. No caves or rock-shelters have yet been excavated.[28a] Thus in a sense, Indian prehistory is, where the European was in 1860. Only one redeeming feature is that in India stone implements are not being collected nor excavations conducted by untrained workmen and amateurs and momentous theories built on some selected material by the scholars working on them.

However, a long way lies ahead which should be trodden by trained men alone so that we shall avoid all those pitfalls which others experienced.

In this work, therefore, care has been taken to use the old concepts and terms which have become standard, though found defective and fallacious, with as much precision, as the data at our command allow us.

28a. Last year a rock-shelter near Hoshangabad was partly excavated.

The Four Ages in India

First the Three Age Theory of THOMSEN. When the prehistoric archaeology in India is divided or grouped into Palaeolithic, Mesolithic, Neolithic and Chalcolithic, it is generally understood that man first knew the use of stone, but not of copper or iron. In this Stone Age, other perishable objects like bone[28b] and wood might have been used, but as only stone has survived, it is called by the most prominent object or artifact of the period. According to the geological and artifactual evidence, this Stone Age is divided into (*a*) Early or Lower Palaeolithic and (*b*) Middle Palaeolithic,[29] leaving room for its final phase (*c*) Upper Palaeolithic when it is fully discovered and identified.

Palaeolithic

Geographically, these Stone Ages were fairly wide-spread, almost coextensive, barring high lands and thickly forested regions and purely coastal or deltaic regions. Sind, Saurashtra, Kerala, Tinnevelly, Assam, Nepal and West Rajputana did not perhaps witness the Early Palaeolithic; and all these except Sind, Saurashtra and West Rajputana did not witness the Middle Stone Age or Palaeolithic either.

Thus, when the term " Palaeolithic " is used, it has slightly restricted connotation. Straightaway, it does not apply to the whole of India.

The climate during the first was comparatively humid than the second. Both were followed by a period of relative dryness.

Economically, man was a savage, a hunter, though he might have subsisted largely on fruits, roots and grubs during the Early Palaeolithic and on the chase with the help of the bow and arrow or/and spear during the Middle Palaeolithic. Lastly, though so far only stone tools have been known of this stage of man's life and nothing else—man's other aspects of life—social, moral, religious—still the word " culture " is applied to it, because stone tools of certain type constantly recur in both the Stone Ages. These form a leading characteristic and give an inkling of the material culture of the man. Hence, instead of grouping the stone tools into simple "assemblages " or " industries," a term of greater significance and connotation, viz. culture, has been used. Strictly, only the former two terms are applicable.

Mesolithic or (Late Stone Age)

The term " Mesolithic " is again used in a much more limited sense. It has been amply proved in a number of sites in England, Western and Northern Europe, parts of Africa, Palestine that the Upper Palaeolithic was succeeded by certain climatic changes, during which man used tiny stone tools, called " microliths." The tools, though small, heralded an advance in technological stage and implied the discovery of the principle of compound tools. Economically, the man was still a hunter, and preferred to live in lightly forested, sandy

28b. Scholars like Professor DART have postulated an earlier " Age of Bone." See "Bone Tools at Makapansgat Australopithecine Locality, Central Transvaal" in the *Archaeological Bulletin*, vol. XIII, No. 51, 1958, p. 74 ff. The maker of these bone tools is called *Australopithecus prometheus*.

29. As explained in the Preface, this may now be called "Middle Stone Age" and the subsequent " Late Stone Age."

regions. It is argued from certain types of tools occurring in certain context that the man, *in a few areas,* might be practising primitive agriculture, that is, cutting with stone-teeth sickles naturally growing stalks of grain—like wild barley and wheat. Thus the term " Mesolithic " has a stratigraphic, chronological, typological and economic significance, *but not universally, and much less in every part of India. Nor can we equate in time or content the various Mesolithic Cultures of India, either with each other within India or with any outside India.*

However, with all these limitations, the term " Mesolithic " helps us in distinguishing a few stone-using cultures *in a few regions* from those of the preceding Stone Age Cultures and the succeeding metal-using cultures of the protohistoric period.

Neolithic

The term " Neolithic " denotes, as now understood, a stage when man did not have the knowledge of copper, but had begun to domesticate a few animals, make pottery, practice primitive agriculture with or without ground or polished stone implements. The last is not an invariable feature of the Neolithic either in India or anywhere else. The most important characteristics are some kind of permanent habitation and production of food. With this yardstick, certain areas in the present States of Andhra-Karnatak-Mysore as well as in Orissa-Bihar-Assam and Kashmir may be grouped into the South-eastern and Eastern Neolithic, though it must be emphasized that the evidence is not at all of a uniform nature. Sharp, clear cut distributions are at present not possible and perhaps can never be had.

Chalcolithic

The " Chalcolithic " has all the above features of the Neolithic, but in addition objects of copper occur in small quantities. The pottery is now generally painted, though not all. Whether these few copper objects were locally made or imported, it has not been ascertained. Hence the uncertainty about the true state of the inhabitants' knowledge of copper, its smelting etc.[29a] The last is indeed a test or the leading characteristic. However, since a few objects of copper occur almost everywhere in the Deccan, Central India, Rajputana Saurashtra and do not occur in the South-east Zone, the former have been assigned to the Chalcolithic. Further all these—the Neolithic and the Chalcolithic—have been simply called cultures, and further distinguished by the name of the type-site, such as Nevasa or Navdatoli Chalcolithic or Bellary Neolithic. In each case, besides pottery, other objects which give some idea of the life of the people are available ; hence to designate them as assemblages or industries would be under-estimating the evidence.

Bronze Age

The " Bronze Age " and " Civilization " are reserved for the Indus Civilization proper, and its manifestation—whether in the Panjab, Rajputana or Saurashtra. For these answer to all the characteristics of a " civilization " as defined by BRAIDWOOD. The Indus people must have had knowledge of the smelting and alloying of copper. It is truly a Bronze Age Civilization and not

29a. Such evidence is now forthcoming from Ahar in south-east Rajasthan and Kaundinypura, near Amaroti in Vidarbha.

" Chalcolithic ", though the inhabitants continued to use long blades of stone. The last only underlines the fact that each period gradually merged into the next, without leaving sharp breaks.

Iron Age

The " Iron Age," that is, the use of iron, instead of copper and bronze, was also not sudden, nor did it take place at the same place everywhere in India. It can only be asserted that its use was fairly general by about the 3rd-4th century B.C. in almost all the parts of India, though no doubt there were large pockets—the hilly forested regions of Central India and Andhra and Assam—where iron might not have reached, and the people were still in a Mesolithic stage. This was also the time when writing, coined money etc. appear and also monumental architecture and a few large cities. Thus one can definitely say that India was largely "civilized" by the 3rd century B.C. We cannot yet define the beginning of this process. Though iron has been found at a few sites like Rajar Dhipi, Ujjain, Alamgirpur, Hastinapur and Kausambi in deposits earlier than the 4th century B.C., still the exact age is unknown. Provisionally, we may fix the 4th-6th century as the date when iron was first introduced in some parts (northern) of India.

Chronological Table

The following table will at a glance show the *present* position of pre-and proto-historic archaeology in India.

	PROTO-HISTORY	
2,500 B.C.- 2,000 B.C.	Bronze Age	Sind Panjab Rajputana Saurashtra
C. 18,00 B.C.- 1,000 B.C.	Chalcolithic	Rajputana Central India Saurashtra Deccan
c. 2000 B.C.	Neolithic	Andhra Karnatak Kashmir
c. 3,500 B.C.	Neolithic	Baluchistan
	PRE-HISTORY	
c. 5,000 B.C.	Mesolithic or Late Stone Age	Langhanaj Mysore Tinnevelly Birbhanpur
	Upper Palaeolithic	? ? Kurnool Kandivli

c. 25,000 B.C.	Middle Palaeolithic or Stone Age	Late Sohan	Panjab
		Nevasian and its other manifestations	Peninsular India, barring Assam, Nepal, Kerala and perhaps extreme S. India.
1,50,000 B.C.[30]	Early Stone Age or Early Palaeolithic	Sohanian or Chopper-chopping tool culture	Panjab
		Hand-axe culture	Panjab and Peninsular India barring Assam, Nepal, Kerala, Sind, W. Rajputana and extreme S. India.

The above chart is presented here with a view to facilitate understanding of the complicated and still very much immature state of the subject[31]. It can best be done for the *general reader* with the help of the Three Age system of THOMSEN, as modified during the last 100 years. Even its most brilliant critic,[32] Dr. GLYN DANIEL, has had recourse to it when he describes the Indus Civilization as Chalcolithic in one of his later publications.[33] This state of things will remain until a more suitable terminology, a "vocabulary" which is more objective than the present is " discovered ". For many scholars in the field have criticized, but few have come forward with a really constructive suggestion which is universally acclaimed.

30. This is a very conservative estimate, based on the palaeontological and other methods of dating the Middle Pleistocene and the associated Abbevillian and Acheulian industries in India. Since, however, the Chellean (Abbevillian) at Olduvai in East Africa can now be dated to about 1,750,000 years by the argon potassium method (LEAKEY, L. S. B. and CURTES, G. H., in *National Geographic, October*, 1961, p. 564), it is to be seen how this affects the dating of these industries elsewhere. Some backward dating of our industries is inevitable, if the claims of this new method are universally accepted.

31. The arrangement of the Chronology on the basis of the Three Age system at once shows its merits and demerits. First it is not of universal application in India, much less for the whole world. Secondly, one has to provide for periods of retrogression, as in Sind and Saurashtra.

32. DANIEL, GLYN, E., *The Three Ages*, Cambridge, 1943.

33. DANIEL, *A Hundred Years of Archaeology*, p. 259.

CHAPTER I

LOWER PALAEOLITHIC CULTURE

Early Stone Age

Geographical Survey

WITH this introduction, a geographical survey, first of the Early or Lower Palaeolithic Cultures in India, is given. Beginning with the Panjab, we move on to the U.P., Bihar, West Bengal, Orissa, Andhra and Madras, the States in the East and South-East India. Proceeding up along the west coast, we have Kerala, Mysore, Maharashtra, Gujarat, Rajputana and Madhya Pradesh, terminating after reaching the heart of India which abuts on the Gangetic plains. Thus we cover the Indo-Gangetic Plains and the uplands and the Peninsular India proper. Now it may not be a pure accident that the two main Early Palaeolithic Cultures of India fall into two groups with distinct geographical features. Thus the Sohanian or the Chopper-Chopping Culture seems to have originated in and confined primarily to the Panjab, whereas the Hand-axe Culture,though of equal antiquity and also found in the Panjab, has its real focus, wide and prolific distribution, in the Peninsular India.

West Panjab

De Terra's Work

De Terra's work is a skillful correlation of the geological and climatic events in the Kashmir valley with the geological deposits containing human records in the foothills of the south-western Himalayas, which constitute what is called the Siwalik hills and the Potwar plateau. The Siwaliks run continuously from the north-west, from the plains of Bannu, near Peshawar to the Brahmaputra in Assam in the east. The Potwar is an elevated plain—a plateau—and includes the Rawalpindi and other districts of Western Panjab. It is the ancient Panchanada, drained by the Indus, the Sohan, the Jhelum, Ravi, Sutlej, and Beas.

Siwaliks and Early Man

Geologically the Siwaliks are comparatively a recent formation. Though 2,00,00 ft. thick, it is all a fresh water deposit and ranges in age from the Late Miocene to the Early Middle Pleistocene. The deposit is divisible into three groups : Lower, Middle and Upper Siwaliks and what is important is that almost all the groups except the topmost have yielded fossils of mammals including those of the anthropoid (apes). So if there is any hope of finding the remains of Early Man, it is here in the Siwaliks.

Hence a great significance was attached to the discovery of stone tools of Early Man in a definite geological context in the Sohan Valley first by Dr. D. N. Wadia and then by Dr. Helmut de Terra between 1928 and 1932. For, the earlier discoveries as far back as 1880 had been merely from the surface.

Nature of Evidence

It was necessary to determine the age of the deposit in the Sohan Valley. This could be done if it contained something of a known character, so that one could proceed from the known to the unknown.

From the previous work in the Kashmir Valley by DAINELLI and DE TERRA'S own on both sides of the Himalayas it was known that the Kashmir Valley had witnessed a series of glacial and interglacial events.

During the glacial times, among other things, huge boulders are carried down the Valley and they bear typical ice action, such as faceted boulders. Such glacial boulders had been found in the Sohan Valley in the Potwar. By a careful mapping and study of glacial geography of the Kashmir Valley and the Potwar plain, the exact sequence of events was to be worked out, so that the part played by man during this long period could be well understood.

Glacial and Interglacial Terraces

Without going into great details, it may be mentioned that De TERRA and PATERSON found that in the Kashmir Valley which had undergone glaciation, five " terraces " could be seen due to the filling up (aggradation) of the Valley by ice and its erosion during the time when the ice retreated and great streams of water were released. In technical words, terraces I and III were caused by degradation during the interglacial periods and terraces II, IV and V by aggradation during the glacial periods. The first terrace was formed during the later half of the second interglacial.

Coming down the foothills, the glacial moraine consisting of faceted boulders and erratics, believed to have been brought down by the second glaciation, were observed in a deposit known as Boulder Conglomerate forming the Upper Siwaliks in the Tawi and Poonch rivers in Jammu. This provided a secure basis for linking the glacial cycle in Kashmir with that in the plains. This was further extended to the Sohan and the Indus valleys where human remains in the shape of tools had been found. It was thus possible to work out a sequence of climatic fluctuations illustrating the environment of man from the Pleistocene times up to the Holocene (or present). (*See Fig. 3.*)

Second Ice Age: Boulder Conglomerate

Definite presence of man is first noticed in the Boulder Conglomerate which forms the topmost surface in the Indus, Sohan and other rivers. It was formed, as shown above, when the Kashmir Valley and the Himalayan slopes were under the mantle of the Second Ice Age and gravel fans, boulder clay and *karewas* were laid down. The Potwar plateau seems to have suffered a period of very heavy rain (pluvial) and the rivers as a consequence carried boulders. It is in these, towards the top, that the tools made of split pebbles and large flakes of quartzite chipped only on one side with large bulbs of percussion and small platforms are found at 11 localities in the Panjab. So far such flakes have not been found from anywhere in India (*sic*)[1] or Asia. They have been, however,

1. This statement is not quite correct in view of the fact that De TERRA mentions the occurrence of "Pre-Sohan-like flakes" in the Narbada. De TERRA and PATERSON, *op. cit.*, p. 316.

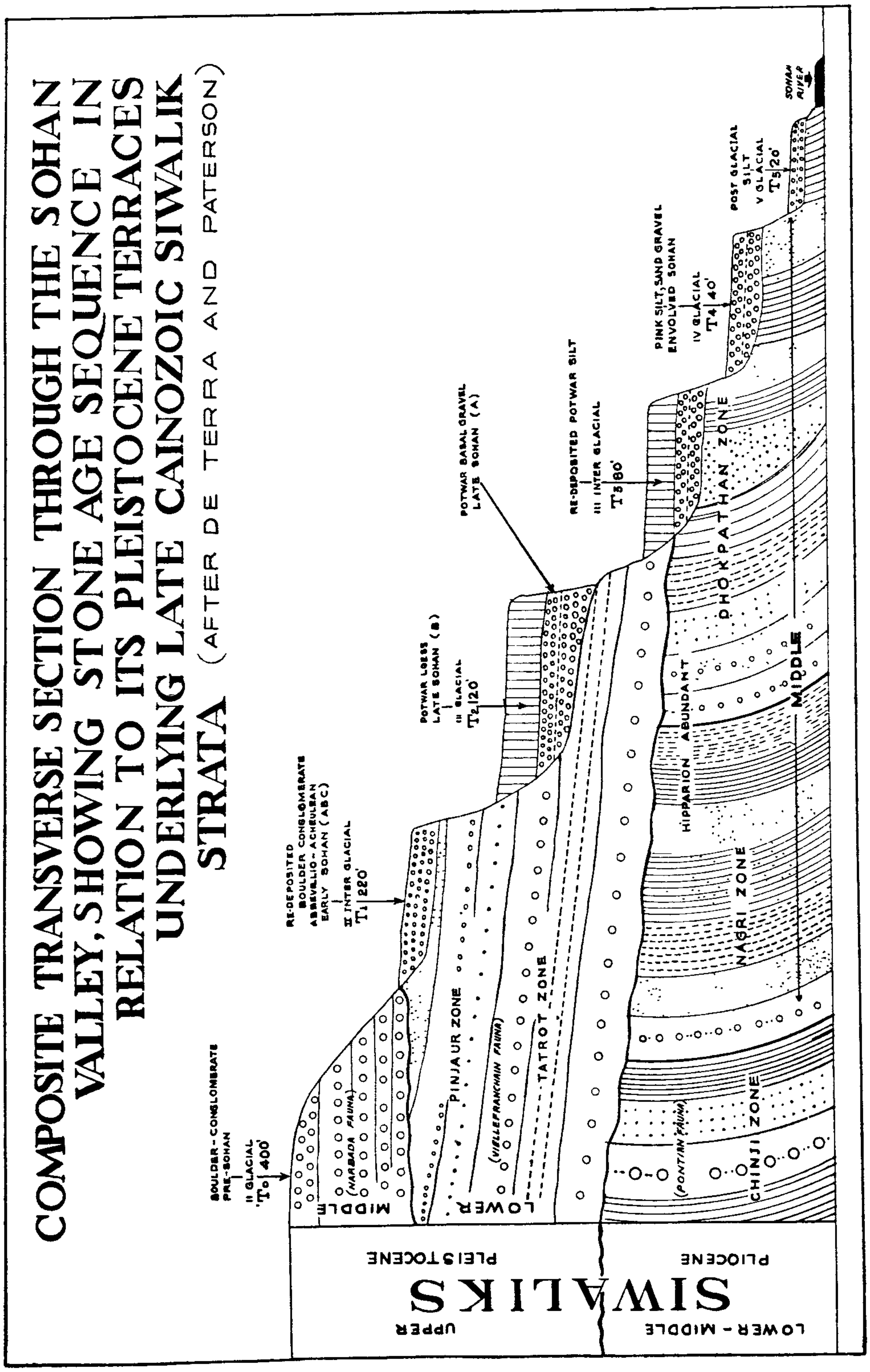


Fig. 3. Transverse Section through the Sohan Valley

compared with the Cromerian[2] of England. To distinguish this from the later Sohan industry and marking a distinct chronological stage, this industry has been called ' Pre-Sohan '. Very few animal remains have been so far found in the Boulder Conglomerate. The presence of a few bones of *Elephas namadicus* suggest that the desposit cannot be earlier than Middle Pleistocene.

Second Interglacial Terrace

A new development then took place. Owing to earthquakes or such movements in the earth, the Boulder Conglomerate which was originally a level formation seems to have been suddenly tilted, and the first rivers—the Indus, the Sohan etc.—were formed in the Potwar. These began to carve out a bed for them by cutting into the Boulder Conglomerate. Thus was formed the " First Terrace ". It is 220 ft. and 410 ft. respectively above the level of the present Sohan and the Indus river beds. The same thing happened in the Kashmir Valley. The ancient lake formed during the Second Glaciation was cut, and the present Jhelum river was formed. This erosional activity, it has to be remembered, was due, not to heavy rains, but mountain uplift and a drier phase called " Interglacial " or " Interpluvial " in the Panjab and Kashmir Valleys. The Peninsular India, at this time was probably experiencing a wetter climate, so that in the Narbada and Godavari Valleys, for instance, such animals as " straight-tusked " elephant (*Elephas namadicus* or *antiquus*), buffalo, hippopotamus, *bos namadicus* and horse could live happily.

Sohan and Hand-Axe Industries

It is in this environment that in the Panjab we find two types of the relics of man. This may imply the existence of two kinds of man : one using the hand-axe, the other largely pebble tools and a few flake tools, which are so different—*atypical*— from the well-known group of hand-axes and cleavers that after the tool types, the industry is called " Chopper–Chopping " or after the river Sohan " Sohan Industry ." It is not a little remarkable that both these groups of tools are found in the deposits of Terrace I, which consists of thin gravels, spread by the re-deposit of the older Boulder Conglomerate. However, more perplexing is the fact that these are *not found together, but at different localities* in the same river Valley, implying independent existence of the two kinds of man in the Panjab during the 2nd interglacial times.

The details of the tool types will be given later. Let us see what happened in the climatic and geomorphologic field.

Third Glacial

Both in Kashmir and in northern Panjab owing to renewed glaciation—the Third Glacial Age—first the streams eroded spreading gravels, and then a very fine silt called loam was deposited all over the Potwar. Thus the new bench or terrace along the Sohan is constituted at the base by gravel and over it is a thick deposit of loessic silt, sometimes over 350 ft. in thickness. This period marks the beginning of the intense wind activity which characterizes the Panjab plains even today, and which, then as now,carries the river silt over great heights. Such a condition as well as the presence of camel among the few fossil remains

2. No longer these flakes from England are regarded as artefacts. See KENNETH, OAKLEY in *Antiquity*, Vol. XXXI (1957), p. 202.

of animals—horse, bison, wolf—in the Potwar indicates that the climate was comparatively dry—semi-arid—as it is today in the Panjab.

Late Sohan Industry

The man was also present and a witness of such profound changes heralding modern conditions. His presence is indicated by the occurrence of tools in the basal Potwar gravel and in the lower 20 ft. of the silt. Since the tools are to some extent stratigraphically and typologically different from the earlier Sohan and exhibit a difference among themselves, the entire assemblage is called Late Sohan Culture. Its chief feature is the appearance of flakes and cores which have undergone previous preparation and technically called " Prepared Core and Flake " or " Levalloisian technique. "

Third Interglacial Terrace III

The story of climatic changes does not end here. After the third glaciation in the Kashmir Valley, there followed an interglacial period, when the heat once again released large streams of water which in their turn eroded the Potwar basin. A new low terrace, 80 ft. high above the Sohan and elsewhere in Poonch, Jammu and Kashmir was formed. No tools of man are found in this terrace. This was once again followed by the Fourth Glaciation in the Kashmir Valley and a period of comparatively heavy rain in the Panjab. So another terrace (T. IV) was formed in Kashmir as well as in the Potwar. But in the former it consists of gravels, while in the latter it is composed of loam, sand and gravel.

Fourth Glaciation Terrace IV

And it is presumed that, as previously during the end of the Interglacial Period, the Potwar must have undergone an uplift, causing the earlier terrace to tilt. The fourth terrace is 40 ft. high in the Sohan and 90 ft. in the Indus.

Evolved Sohan Industry

So far tools have been reported from two sites viz. Pindi Gheb and Dhok Pathan which may be assigned to this terrace. Technologically, the tools seem to be a further development of the Levalloisian noticed in the Late Sohan Industry. The flakes are now thinner and slender, more blade-like ; hence it is regarded as Upper Palaeolithic or Evolved Sohan. The lowest terrace (T.V.), 20 ft. above the present stream, was formed during comparatively recent times (or Holocene).

Thus we observe a fine correspondence between the climatic cycle in Kashmir and the foothills of the Himalayas forming the Potwar plateau and the evolution of man and his tools. In summary, then, when colder conditions obtained in the hills and higher altitudes, the plains were covered with gravels and silts ; whereas under warm temperate conditions, the ice retreated from the hill slopes to still higher altitudes, and this caused erosion on the plains. This phenomenon is also comparable to those witnessed in the Alps. Thus the following correlation is proposed.[3]

3. In the last column, the words within brackets are based on the correlation suggested by ZEUNER, F. E. *Dating the Past*, (London, 1952), p. 275.

ZEUNER also proposed an alternative explanation based on astronomical theory. According to this, the glacial phases of the Western Himalayas would be regarded as the local fluctuations of solar radiation and the influ-

Age	*N. W. Panjab*	*Kashmir*	*Climate*	*Europe*
Upper Pleistocene	Terrace 4 (Loam silt)	Moraine Terrace 4	IV Glacial	Wurm (or Last (Glacial)
	Terrace 3 (Erosional)		III Interglacial	
	Terrace 2 (Potwar loess)	Moraine Terrace 2	III Glacial	Riss (Penultimate Glaciation)
Middle Pleistocene	Terrace 1 (Erosional)	Upper Karewas	II Interglacial	
	Boulder Conglomerate	Karewas gravel	II Glacial	Mindel (Ante-Penultimate Glaciation)
Lower Pleistocene	Pinjor	Lower Karewas	I Interglacial	
	Tatrot gravel	Moraine I	I Glacial	Günz

The first traces of man occur in the 2nd Glacial period. But these are very scanty. It is from the end of 2nd Interglacial that tools of different facies or character begin to appear in large numbers and go on changing through the subsequent 3rd Glacial and Interglacial times.

Industries

We shall see now these tools of various periods in more detail. They fall into five major tool assemblage or industries. (I) Pre-Sohan, (II) Early Sohan, (III) Late Sohan, (IV) Chauntra Industry, (V) Evolved Sohan. (*See Fig. 4*)

Pre-Sohan Industry

The tools which constitute the earliest Palaeolithic Culture in India consist of large flakes made from crude split pebbles. All are rolled. The upper surface is generally unworked except for occasional marginal scars, whereas the undersurface shows the primary flaked surface with flat bulbs, but large well-developed cones ; the striking platforms are simple, unfaceted. There is no secondary working, but the edges are worn out either by nature or by use.

Such tools are found near the top of the Boulder Conglomerate at Malakpur, Adial, Chauntra, Kallar, Chaomukh and Jammu in Potwar, south-east of Rawalpindi.

So far De TERRA has illustrated only one tool of this industry. Since he also refers to a similar industry from the Narbada, but does not illustrate it, a similar tool from the Maheshwar area is here illustrated from the Deccan College Collection.

Early Sohan Industry

This industry consists of a large number of tools made on split pebbles (or pebble halves) and comparatively small number of flakes, the material comprising varieties of fine-grained quartzite as well as smooth greenish grey Panjab trap.

ence of the Mediterranean pluvials. Further he thinks that the sequence of five terraces following the Boulder Conglomerate suggests a sequence of glacial phases similar to those of the Alps, sub-dividing the major glaciations. If the " interglacial " terraces are interpreted as representatives of less intense glacial phases, then the first and second terraces would correspond to Penultimate Glaciation (PGl_1) and PGl_2 and the third to three stages of the Last Glaciation.

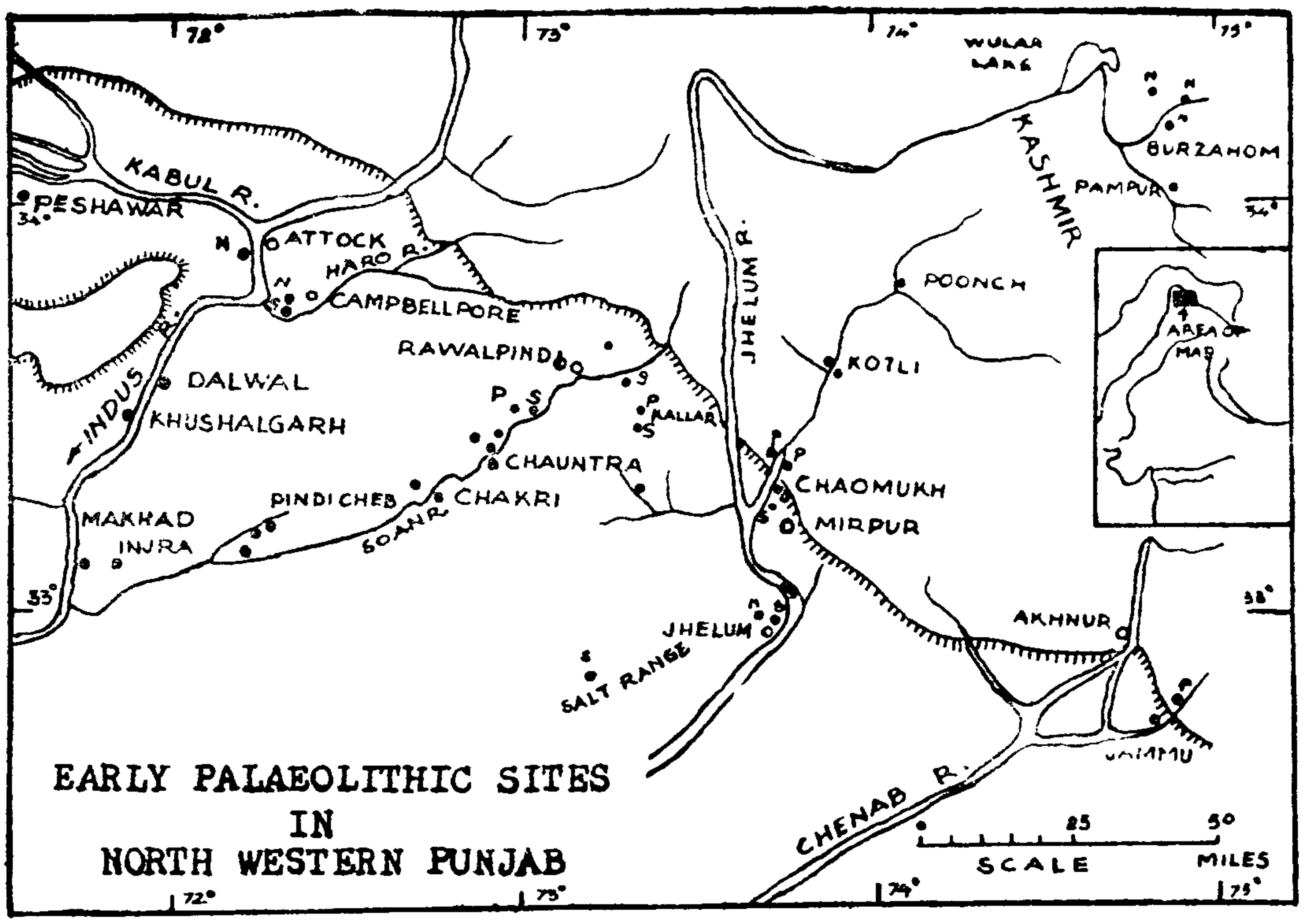


Fig. 4 Early Palaeolithic Sites in N.W. Panjab

Patination and the state of wear divide these tools into three groups, called A, B, C. Though there is no stratigraphic evidence to support this classification, it appears that Group A, which is heavily patinated and much rolled, is the earliest, Group B though deeply patinated is unworn, and Group C is less patinated and fairly fresh.

Among all these groups, there are pebble tools, scrapers, cores and flakes and a few proto-hand-axes. But the first predominates and the characteristic method of flaking them, *generally from underside up and not both faces or sides of the pebble,* makes the Early Sohan primarily a pebble-tool industry,[4] though some how an impression has been current that the Sohan is a flake industry.[5]

Pebble Tools: Choppers

For the pebble tools, which are either (*i*) " flat-based " or (*ii*) " rounded " as described by PATERSON, MOVIUS has proposed the name " choppers ". In the former—flat-based variety—the flakes have been struck upward in such a way as to form a thick, steep cutting edge. This edge is either convex, straight and rarely pointed, but never concave. It is further marked by secondary retouch, either on one side or both sides, so that we have single or double-sided choppers.

The " rounded pebble tools " differ from the others not only in shape, but in the method of flaking. The flakes have been struck *from the original surface of the pebble* and not from the flat under surface. However, the cutting edge is made from one side only, and hence both these varieties of pebble tools or choppers, are really ' *unifacial* ', though it is worth observing that among the second sub-group not only is the edge concave, but in one case (No. 11), the tool has taken the shape of a proto-handaxe. In very rare cases, both the ends are worked, with the result that the tools form an inverse, double-ended chopper with a rough parallelogram-shaped section.

Chopping Tools

Pebble-tools, having rounded pebble back and a jagged, wavy or w-shaped edge worked from both sides by alternate flaking are called ' chopping tools ' by MOVIUS. These are in a sense ' *bifacial* ' tools.

Flake Tools and Cores

There are no flakes in Group A. In Group B we have primarily flakes which in many cases retain the cortex on the upper surface and the platform is unaffected or not prepared, and the angle with the flake surface is comparatively high. However, Group C exhibits flakes which show extensive primary flaking and even simple faceted striking platform. Both these techniques are suggestive of a " Proto-Levalloisian " or " prepared core and faceted platform " technique. Corresponding to both these types of flakes there are " Clacton-like " and tortoise type cores. The former are roughly discoidal or elongated in shape and flaked almost all over.

4. *Cf.* MOVIUS, Hallam, L., " Pebble-Tool Terminology in India and Pakistan ," *Man in India*, Vol. 37, p. 150, and " The Lower Palaeolithic Cultures of Southern and Eastern Asia ," in *Transactions of the American Philosophical Society*, Vol. 38, Pt. i, (Philadelphia, 1948,) pp. 349 and 377-79.

5. KRISHNASWAMI, V. D., *A.I.* No. 3, 1947, p. 23, and BOSE, N. K., *JASB* (Letters), Vol. XXI, p. 74, and SANKALIA, H. D., " Is the Sohan a Flake Industry ?" in *JASB* (Science), Vol. XXII, 2 (1957), p. 161. *Cf.* also SOUNDARA RAJAN in *A.I.*, No. 17, 1961, p. 72

Late Sohan Industry

This is stratigraphically and typologically divisible into (1) Late Sohan A and (2) Late Sohan B.

Late Sohan A

The tools of this industry occur in the basal gravel of T.2 which belongs to the Third Glacial age. A large majority of the tools comprise pebble tools and Clacton-like flakes which characterize Early Sohan. But we find besides, a small number of flakes and cores. The former are skilfully flaked on the upper surface, implying a clear preparation of the core. A few parallel-sided blades and elongated flakes also appear, which strengthens the general impression that the Late Sohan A is definitely " Levalloisian " in character and falls into the Middle Stone Age or Palaeolithic Period in the early part of the Upper Pleistocene.

Late Sohan B

This industry found at the bottom of the thick Potwar loessic silt of the Third Interglacial or Glacial (?) stage continues the Levalloisian tradition noticed in Late Sohan A. Nearly 50 per cent of the flakes show faceted striking platforms and their upper surfaces are carefully trimmed. Though no retouched specimens are found, the flakes and cores, barring pebble tools, remind one of the Late Levalloisian of Western Europe.

The Late Sohan Culture was very wide-spread in the Panjab, as it has been recorded from no less than 21 sites.

Evolved Sohan Industry

MOVIUS gave this name to the assemblage of tools from Dhok Pathan, a site near Pindi Gheb, and belongs probably to the Fourth Glacial Age. The tools are not much different from those of the Early and Late Sohan, though comparatively smaller. One new type of tool " is a kind of awl made on a small oval pebble flaked on both surfaces at one end to form a sharp point." Since this recalls a typical tool of Series II or Middle Stone Age of the Peninsular India, it is reproduced here.

The Hand-Axe Industry

It was mentioned earlier that a few tools—hand axes or bifaces—in a heavily rolled condition are found at some four sites in the Sohan Valley. (*i*) at a site near Rawalpindi in the gravels of the Second Interglacial Period (T. 1), (*ii*) at Chauntra in deposits of the Third Glacial (T. 2), (*iii*) at Adial on the surface, (*iv*) at Balwal, near Chakri, in the gravels of the Third Glacial (T. 2), which were derived from those of T.1, (*v*) at Gariala, near Attock in the Indus valley, in the gravels of T.2.

Stratigraphically the tools at the first site are thus the earliest and here alone they are found unmixed with those of the Sohan culture. At Chauntra, Adial and Balwal, the bifaces are found in association with Early and Late Sohan tools, whereas at Gariala alone, a very rolled cleaver was found. From this it would appear that the hand-axe culture had first perhaps an independent exist-

ence in the Panjab. Since then, it is found in similarly dated deposits, it is not possible to say which culture is earlier—the Hand-axe or the Sohan—excluding of course, the earliest Pre-Sohan Flake Industry.

As far as the tools—hand-axes, cleavers, and flakes—are concerned it is important to note that both the primitive looking hand-axes—heavy, massive, crudely worked and pebble-butted—and the better, more refined with regular outline, flatter flake scars and the cortex completely removed, are found together as elsewhere in India ; and that even the better hand-axes of superior—recalling Middle Acheulian—technique are found in the earliest deposits. Hence the distinction between the hand-axes into Abbevillian and Acheulian is only typological, and has no basis in stratigraphy. However, it is also possible that beautiful ovates, and heart-shaped hand-axes from Chauntra are indeed later.

Age and Culture Complex

Besides these hand-axes and occasional cleavers, there do occur a few cores, discoidal cores and crudely retouched flakes, some with plain striking platform. These, however, form a normal complement of the hand-axe culture in India and Africa, and now, as is being realized, in Western Europe as well. Thus the Panjab hand-axe culture is stratigraphically of the Middle Pleistocene age and typologically belongs to the great Lower Palaeolithic Hand-axe Culture.

It together with the Sohan Culture seems to have survived all through the Third Glacial and later climatic phases in the region, albeit with some improvement in technique and form, which unfortunately are not so well documented stratigraphically as in the Late Sohan.

Description : Illustrated Tools

The illustrated tools are briefly described : (*See Fig. 5*)

Pre-Sohan, Second Glacial

1. Large massive flake with plain unfaceted striking platform at a low angle and with well-developed cone. The central upper surface is unflaked, but large flakes have been removed from the sides. The secondary work on the edges is believed to be later. From the top of the Boulder Conglomerate, Second Glacial at Kallar. Quartzite, rolled.[6]
2. Large triangular flake with well-developed cone now partly flaked. From the upper surface one large flake has been previously removed while the flake formed a part of the core ; the rest has cortex. The edges have been boldly retouched. From the Narbada at Maheshwar. Dark brown quartzite. Illustrated here for comparison with the pre-Sohan flake.

Early Sohan Pebble Tools, Second Interglacial

3. " Flat-based pebble tool made on a portion of a pebble having one side flat or nearly so. From this surface flakes are struck off steeply toward the upper rounded surface, resulting in strong working edge ," which is slightly convex. Flaking both " free " and " step."[7] Such a type of pebble tool is called " Chopper " by Dr. Movius.[8]
4. " An elongated oval pebble with flat cleavage or flake surface " from which flakes have been struck upward.[9] Chopper.

6. De Terra and Paterson, *op. cit.*, pp. 303-05, pl. XXXIII, 2.
7. *Ibid.*, p. 306, pl. XXXIV.
8. Movius, *op. cit.*, p. 378.
9. De Terra and Paterson, *op. cit.*, p. 306, pl. XXXIV, 4.

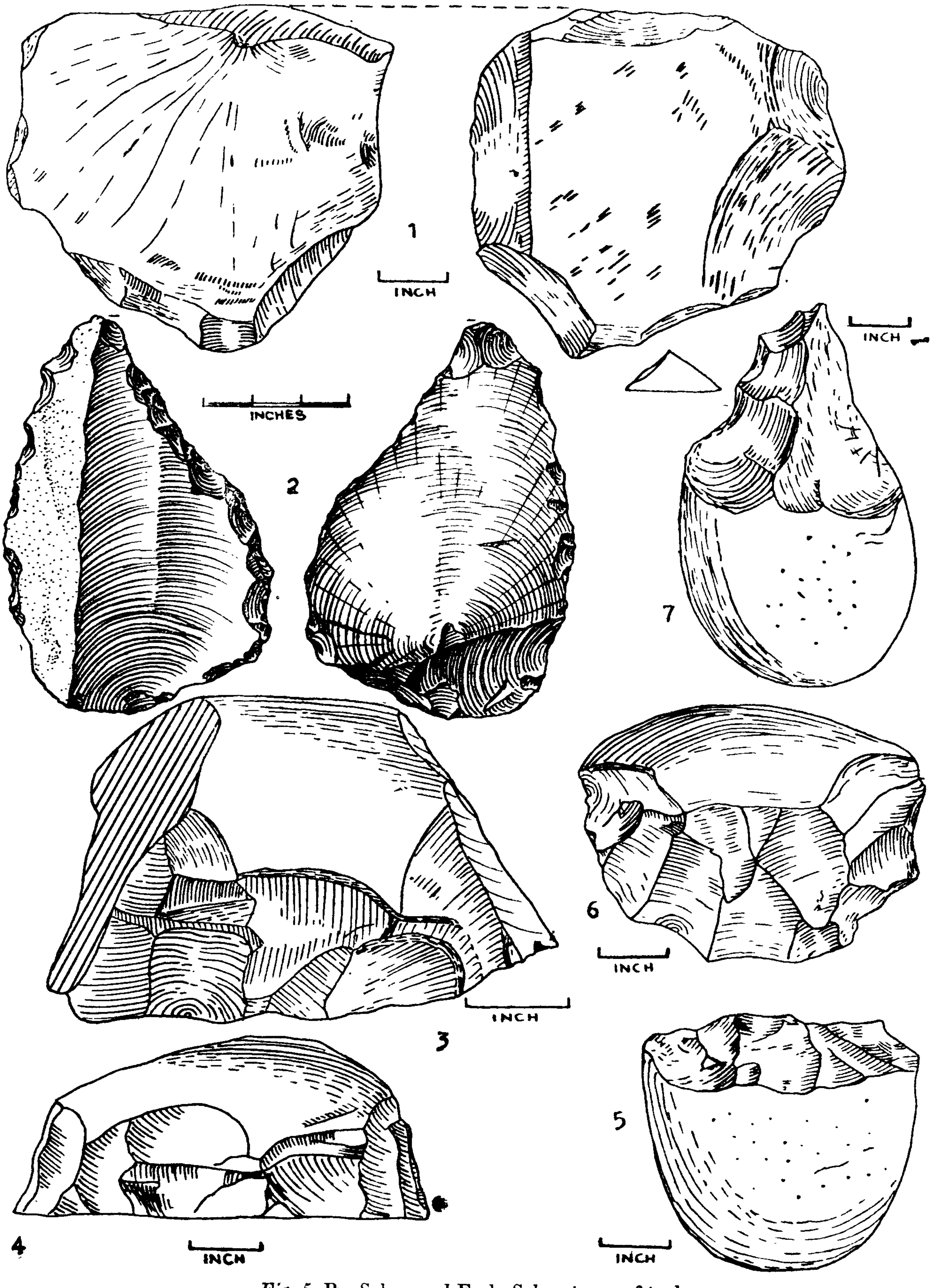


Fig. 5 Pre-Sohan and Early Sohan types of tools

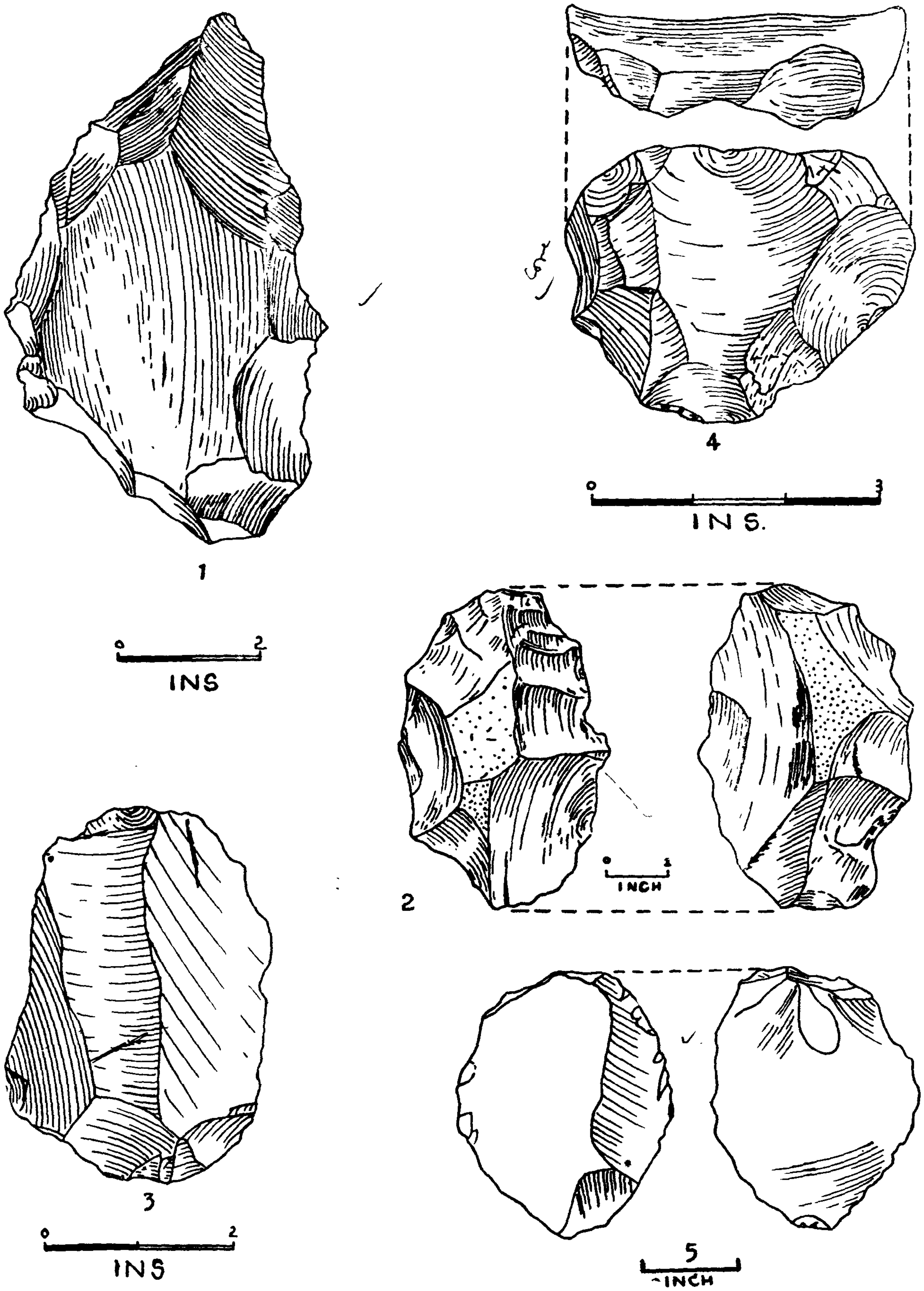


Fig. 6 Early Sohan Flakes and Cores

5. Half of a flatish oval pebble flaked from one surface (lower) only, halfway around the periphery. The angle of this flaking varies from 20° to 65° to the undersuface.[10] MOVIUS states that in this and other cases the flakes have been struck from the original pebble surface, rather than from a flat platform. From the drawing this does not appear to be so. Chopping tool.[11]

6. Another variety of the above; here the flaking is taken almost around the periphery.[12] Chopping tool.

7. " A flat oval pebble is flaked from one surface at one end " from " opposite sides so as to produce a point ". Proto-hand-axe of MOVIUS.[13]

Early Sohan Cores and Flakes (*See Fig. 6*)

1. This is included both by DE TERRA and MOVIUS among "Flat-based pebble tools," [14] but could as well be regarded as a " Discoidal type of core ". Compare for example, DE TERRA, Pl. XXXVI, 1.

2. Discoidal core from which three or four large and one or two small flakes have been removed, with a patch of cortex in the centre.[15]

3. A flake having unfaceted platform, and the angle with the under surface wide. Upper surface partly flaked.[16]

4. Proto-Levalloisian core, flat with under surface cortex and striking platform simply prepared at each end by the removal of two or three small flakes.[17]

5. Levalloisian type of flake with low angle and faceted platform, bulb erased.[18]

Late Sohan A Cores and Flakes, Third Glacial (*See Fig. 7*)

1-2 Discoidal Cores. " Flattened circular pebble flaked all around the periphery alternatively from each surface, resulting in a diamond-shaped cross section, with a wavy edge." Sometimes a patch of cortex in the centre as in No. 2.[19]

3. Levalloisian type of core on a flat pebble with faceted platform, though it is not fully prepared as in true Levallois core.[20]

4-5. Core on a flat pebble with flakes struck off at both ends and sides.[21]

6. A triangular flake with convergent flake scars on upper surface and little retouch.[22]

7. A roughly oval flake with traces of cortex and convergent flake scars on the upper surface. Margins are partly retouched in such a way as to suggest a hollow scraper-and borer.[23]

8. An oval flake with convergent flake scars on the surface and a number of side scars indicating previous preparation on the core.[24]

9. A blade or elongated flake of Late Sohan B culture. According to PATERSON, " these flakes have certain resemblances to the late Levallois of Europe."[25]

10. De TERRA and PATERSON, *op. cit.*, pl. XXXV, 5.
11. MOVIUS, *op. cit.*, p. 379.
12. De TERRA, *op. cit.*, pl. XXXV, 4.
13. MOVIUS, *op. cit.*, p. 379.
14. DE TERRA, *op. cit.*, p. 306, pl. XXXIV, 3.
15. *Ibid.*, p. 307, pl. XXXVI. 5.
16. *Ibid.*, p. 307, pl. 4. XXXVII, 6.
17. *Ibid.*, pl. 307, XXXVIII, 5.
18. *Ibid.*, pl. XXXVIII, 2.
19. De TERRA, *op. cit.*, p. 309, pl. XL, 2, 5.
20. *Ibid.*, p. 309, pl. XXXIX, 5.
21. *Ibid.*, p. 309, pl. XXXIX, 1.
22. *Ibid.*, p. 311, pl. XLI, 3.
23. *Ibid.*, p. 310, pl. XLI, 10.
24. *Ibid.*, p. 310, pl. XLI, 9.
25. *Ibid.*, p. 310, pl. XLI, 6.

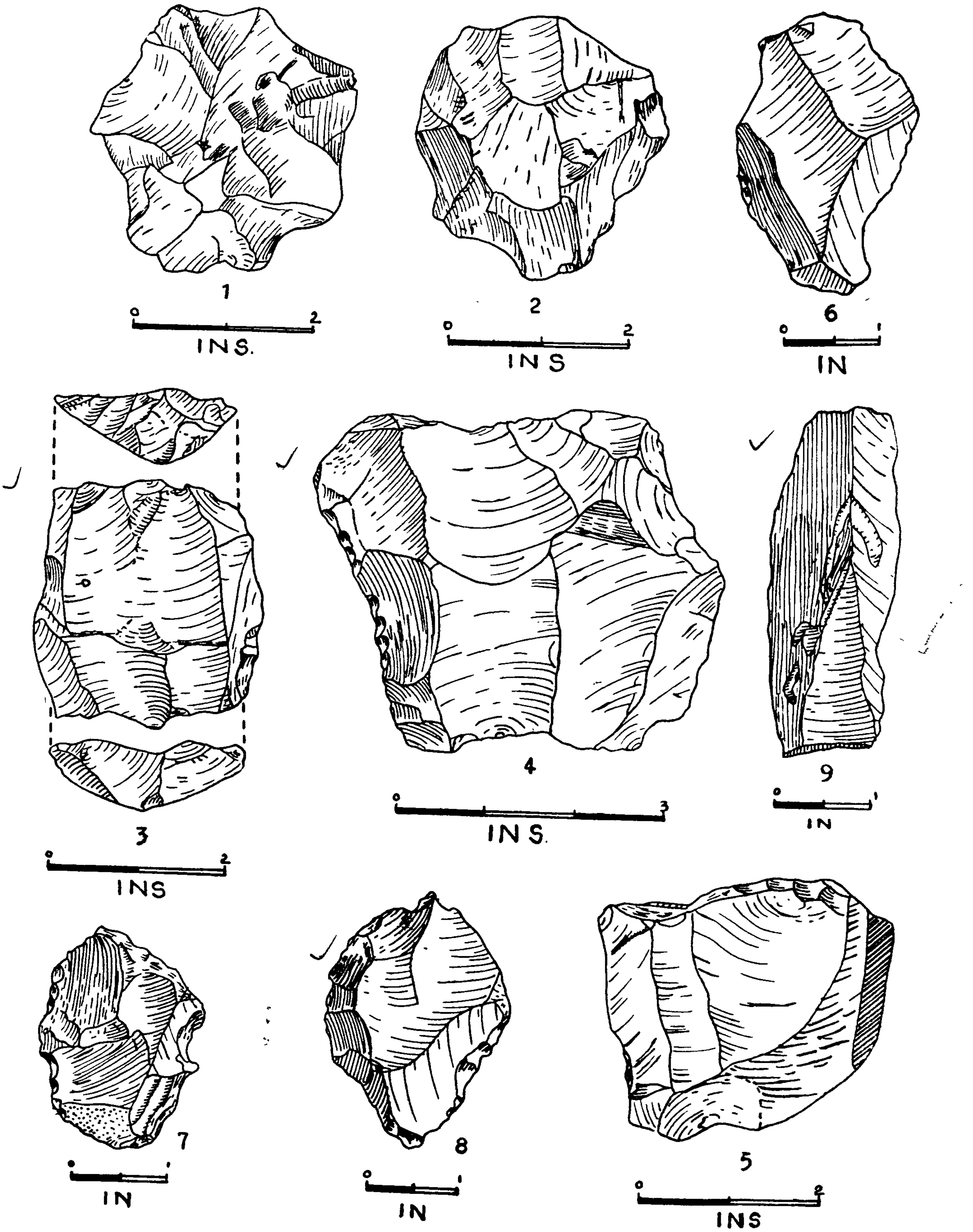


Fig. 7 Late Sohan Cores and Flakes

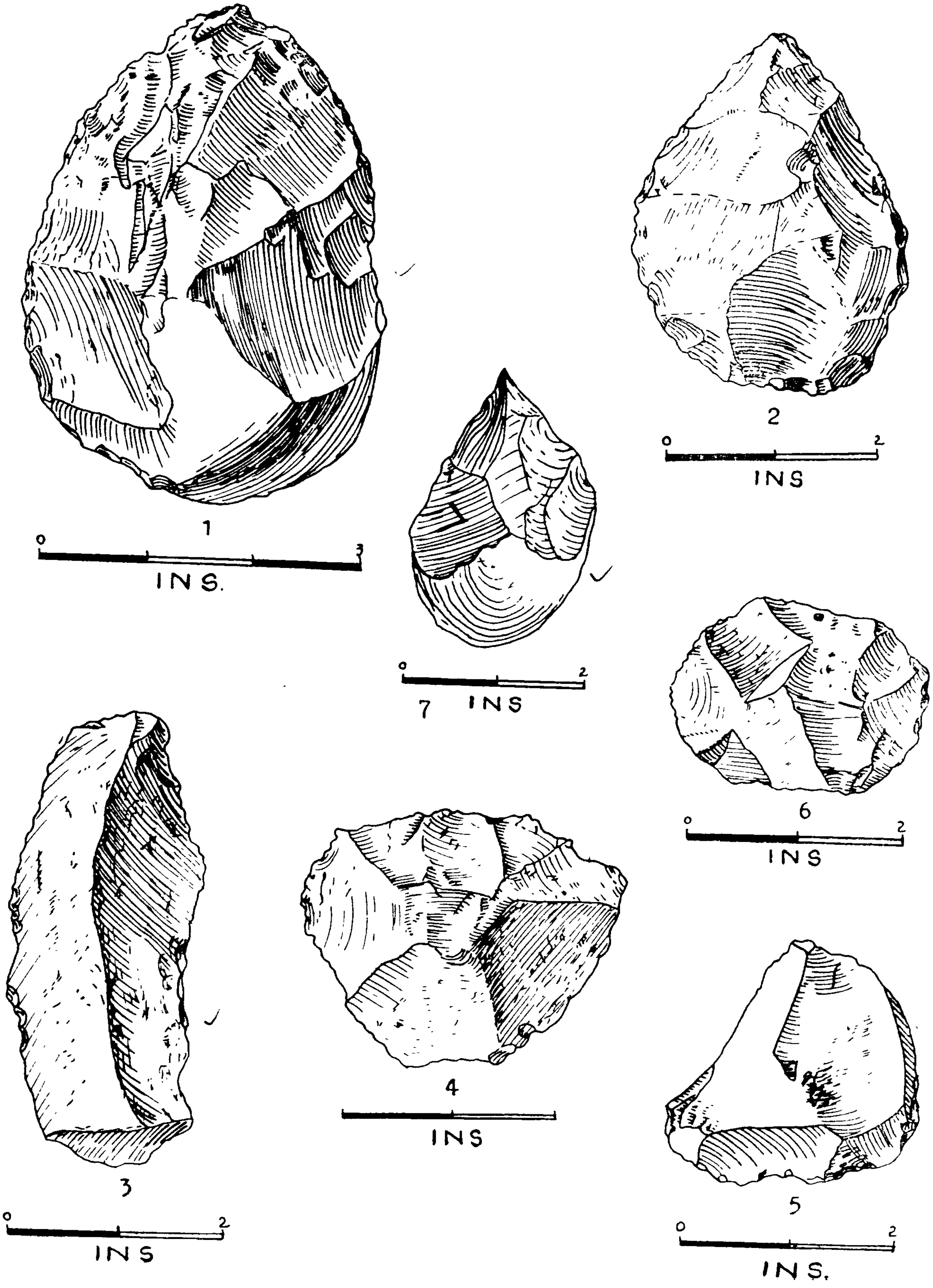


Fig. 8 Chauntra and Evolved Sohan tools

Chauntra Industry, Third Interglacial? (See Fig. 8)

1 Pointed ovate hand-axe on a flake, the upper surface well-chipped by step flaking, leaving a patch of cortex near the butt. The under surface has not been retouched except a little near the edge.[26]

2 Cordate type hand-axe. "Late Acheulian."[27]

3 A fine blade.[28]

4 This is described as "a flake with convergent primary flaking,"[29] but in fact looks like a core of this type.

5 This is also described as a "flake with convergent primary flaking."[30]

6 Discoidal core of Late Sohan type.[31]

Evolved Sohan, Fourth Glacial

7 An awl made on a pebble by flaking on both surfaces at one end so as to form a sharp point.[32]

East Panjab

During the war, it was not possible to examine the other river valleys of the Panjab. After partition the areas already known went to Pakistan. Fortunately chance discoveries have opened up a promising field of inquiry in Eastern Panjab. (*See Fig. 9*)

Sirsa Valley

The first is the site of Nalagarh[33] on the Sirsa river, a tributary of the Sutlej in the foot-hills of the Simla Himalayas, not very far from Rupar and from the Bhakra Nangal Project, Hoshiarpur District.

The palaeolithic sites were first discovered by Mr. Olaf Prufer in 1951 on the terraces of the right bank of the Sirsa. These are generally concentrated on the south and south-east of Nalagarh, but are also found on the western side. Sen's later observations indicate three terraces approximately at the height of 70 ft., 40 ft. and 10 ft. respectively from the present stream level. The tools have been found on the first two terraces. On the Upper terrace, the gravel is at places cemented, while on the Middle terraces it is loose and has a thin cover of silt.

The tools are made of light coloured quartzite and consist of pebble tools and flake tools. There is not much typological difference between the tools from the Upper and Middle terraces, though the tendency is for the flake tools to predominate and on the whole they become finer.

The pebble tools are made on rounded water-worn pebbles and include primarily choppers and scrapers. It is interesting to note that "the flakes are

26. De Terra, *op. cit.*, p. 310.
27. *Ibid.*, pl. XLIII, 5.
28. *Ibid.*, pl XLIII, 4.
29. *Ibid.*, p. 310, pl. XLIII, 2.
30. *Ibid.*, pl. XLIII, 1.
31. *Ibid.*, pl. XLIII, 3.
32. *Ibid.*, p. 311, pl. XLIV, 9.
33. Sen, D., "Nalagarh Palaeolithic Culture", *Man In India*, Vol. 35 (1955), pp. 177-84.

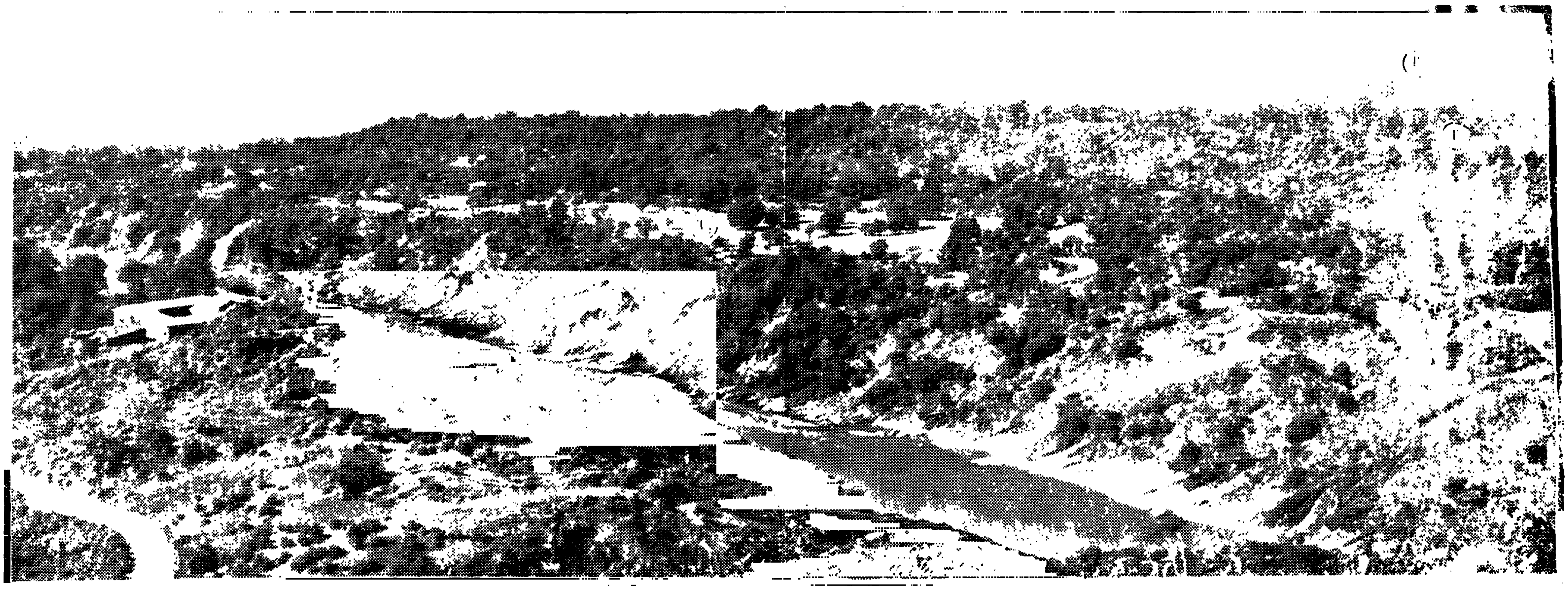


Fig. 10. Panoramic view of the "terraces," near Guler on the Banganga, East Panjab.

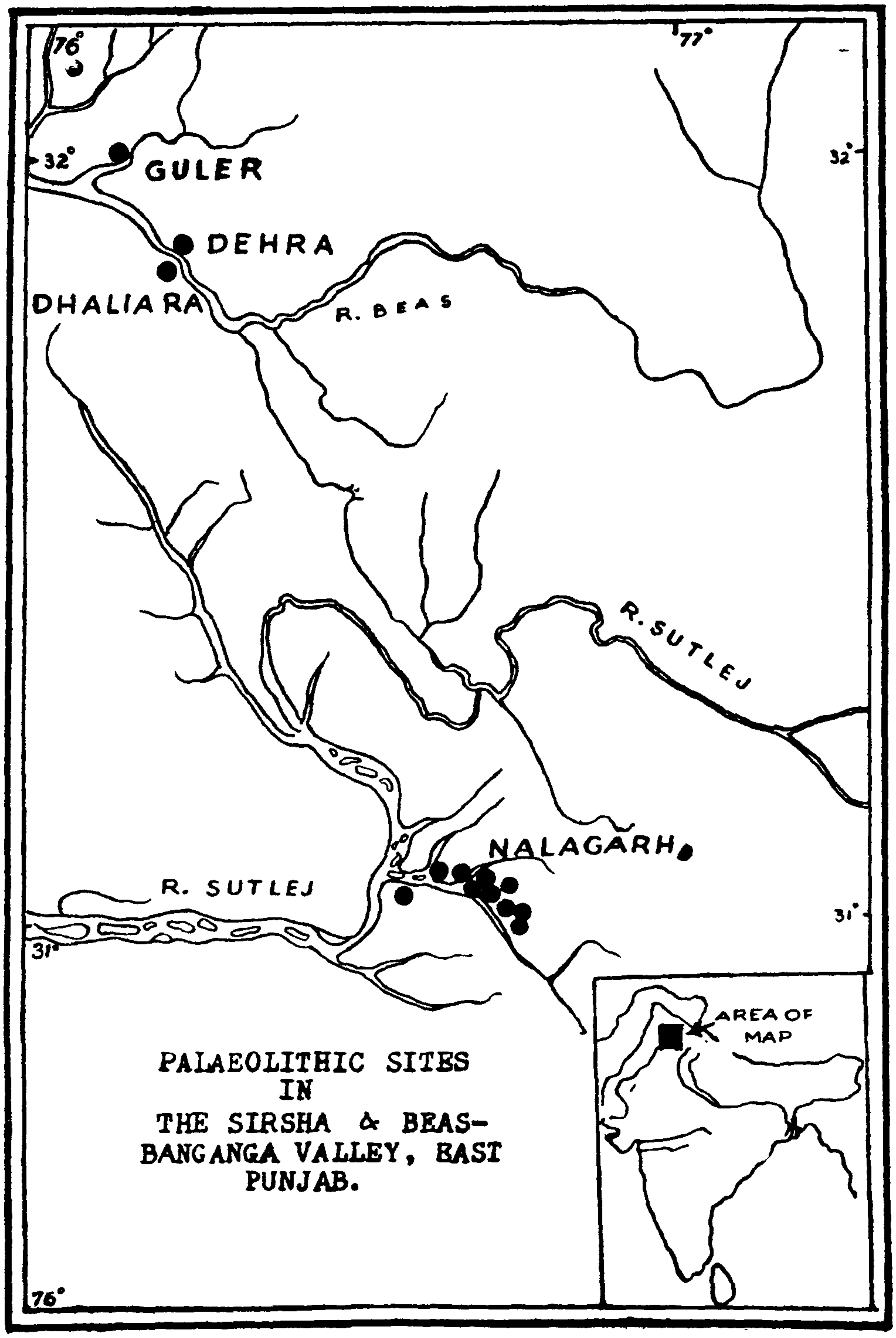
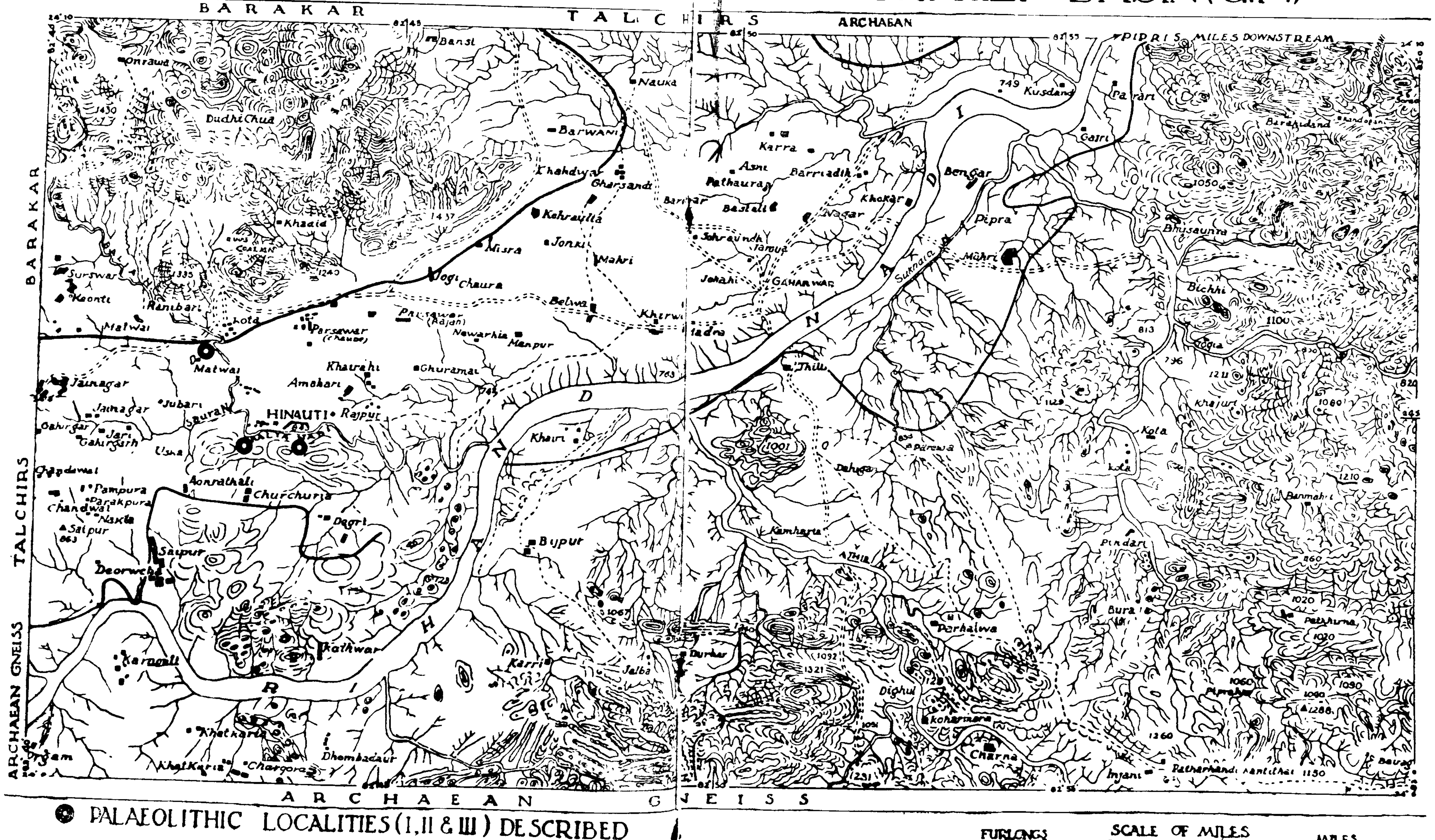

76°
77°
32°
GULER
DEHRA
DHALIARA
R. BEAS
R. SUTLEJ
NALAGARH
R. SUTLEJ
31°
AREA OF MAP
PALAEOLITHIC SITES
IN
THE SIRSHA & BEAS-
BANGANGA VALLEY, EAST
PUNJAB.

Fig. 9

PHYSIOGRAPHY OF THE SINGRAULI BASIN (U.P.)



● PALAEOLITHIC LOCALITIES (I, II & III) DESCRIBED

FURLONGS SCALE OF MILES 5 MILES

Fig. 11

struck from the original pebble surfaces " as in some of the tools in the Sohan. They (the choppers) are further marked by " two directional alternate flaking." This is in contrast to what one knows about the Early Sohan. The scrapers are flaked on one side only. One tool, No. 12, is described as an " awl ". It is said to be " flaked all over and had a notch below the working point."[34] Both the name and the description suggest a highly advanced tool[35] not characteristic of the Early Sohan.

The associated flakes show nothing special about them. Both—the pebble tools as well as the flakes—typologically resemble the Early Sohan of the north-west Panjab, but it cannot be said whether the Nalagarh industry belongs to the Second Interglacial or not, without much further work in the region.[36]

In 1954, Dr. Y. D. SHARMA[37] reported more tools from the same valley and from another Sohan, a tributary of the Beas, near Daulatapur. They have been called " Late Sohan ", but in the absence of any further report nothing can be said about these tools.[38]

Beas and Banganga Valleys (See Fig. 10)

Then in 1955, Shri B. B. LAL,[39] found Sohan type of tools in the Beas and Banganga valleys in Kangra District, East Panjab. He also noticed five terraces at Guler and elsewhere, and tried to correlate the tools with the terraces. Later a joint expedition organized by the Government of India and assisted by the Deccan College, the M. S. University of Baroda and the Geological Survey of India re-examined the area for some three weeks in 1957.

There is no doubt that at Guler, Dehr and at Kangra there are a number of terraces. Those at Guler, for instance are at a height of 565 ft. (T.1), 375 ft. (T.2), 150 ft. (T.3), 90 ft. (T.4) and 30 ft. (T.5) respectively. T.1 yielded only unifacial " choppers ", while T.2 these as well as " chopping tools " and one pebble-hand-axe, a core and six Clactonian flakes and proto-Levalloisian flakes, while T. 3 gave similar material but without the proto-Levalloisian flakes.

The tools thus are of the Early Sohan type, though it must be said that the percentage of genuine tools is indeed very small,[40] and many of the choppers on pebbles and flakes might be just pebbles and flakes.

Further south-westwards the Ganga-Yamuna basin has not yet been studied. The writer had noticed terraces at Dehra Dun and huge boulder spread as well as sections, and it is not improbable that a careful search will yield the types of tools first described.

34. SEN, *op. cit.*, p. 184.

35. This indeed recalls the " borer-cum-scraper " of Series II or the Middle Palaeolithic of Peninsular India. See, Figs. 38-39.

36. Since writing this, the writer had an opportunity to visit Nalagarh and therefore could say that the region deserved an intensive survey.

37. *I.A.R.*, 1954-55, p. 58.

38. Efforts were made to study these tools, but unfortunately these could not be located, either at New Dehli or Nagpur.

39. " Palaeoliths from the Beas and Banganga Valleys," *A.I.* No. 12, pp. 58-92.

40. This impression was confirmed when the writer along with B. SUBBARAO re-examined the collection, now in the Safdarjang Museum, New Delhi, with the facilities kindly supplied by Shri LAL and Shri GHOSH.

UTTAR PRADESH

Southwards are the large flat alluvial plains, made by the Ganga and its tributaries by washing the Himalayas. These, however, abut on the older rock formation of the peninsular mass viz. the Kaimur Hills, a little south of Banaras and now forming the Mirzapur District. Here COCKBURN[41] had discovered palaeolithic tools from the Singrauli basin in the last century (1883). De TERRA[42] after his study of the Himalayan cycle in 1935 had suggested that investigations might be carried out in this region, because the two great geological formations—the Himalayas and the Peninsular—met there and he expected that this feature might reveal contact between the Sohan and the Hand-axe cultures and also throw light on the past climate and tectonic movements. Accordingly it was examined for a short while by ZEUNER and KRISHNASWAMI in 1949 and the results of the latter's study are published.[43]

Singrauli Basin (See Fig. 11)

The Rihand, the Bichi Nala and other rivers of the Singrauli basin, like those of the Peninsular India, exhibit a two-fold cycle of aggradation consisting of (*i*) lower gravel (mostly pebbles) and silt, followed by another cycle of smaller and finer gravel and silt, the first resting on the Talchir beds of green laminated shales and soft sandstones. (*See Fig. 12*)

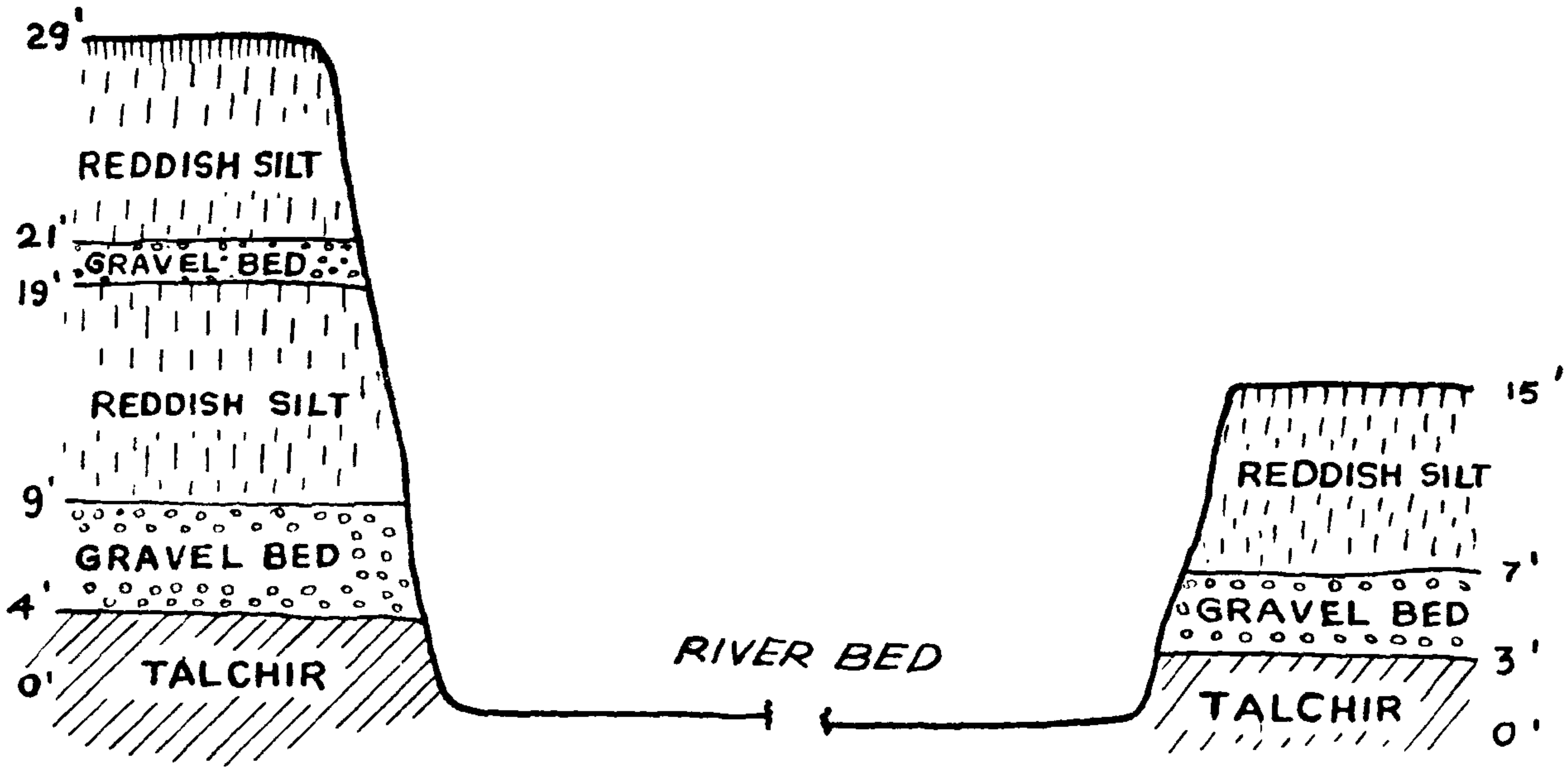
It is the lower gravels which yield tools made of coarse-grained grey and brown quartzite. These comprise primarily (*i*) crude hand-axes on pebble as well as fine ovate type hand-axes on flakes, (*ii*) cleavers, (*iii*) cores, (*iv*) choppers and chopping tools, (*v*) Levallois and proto-Levallois flakes. Evidently it is a mixed industry and since all the tools come from one and the same layer, it is difficult to say that the pebble tools forming choppers were the earliest and the hand-axe etc. later and the Levallois flakes still later. It is, however, inferred by the authors that the few choppers and the proto-Levallois flakes suggest Sohan influence on the pre-existing hand-axe culture.[44]

Some of the hand-axes and the cleavers are of a much more advanced type recalling those from Attirampakam, near Madras and evolved Acheulian. And in several areas, Giddalur and Gangapur near Nasik, for instance, these are associated with Levallois flakes. Thus the so-called Choppers and proto-Levallois flakes seem to form an integral part of the hand-axe-cleaver culture.

Yamuna Valley

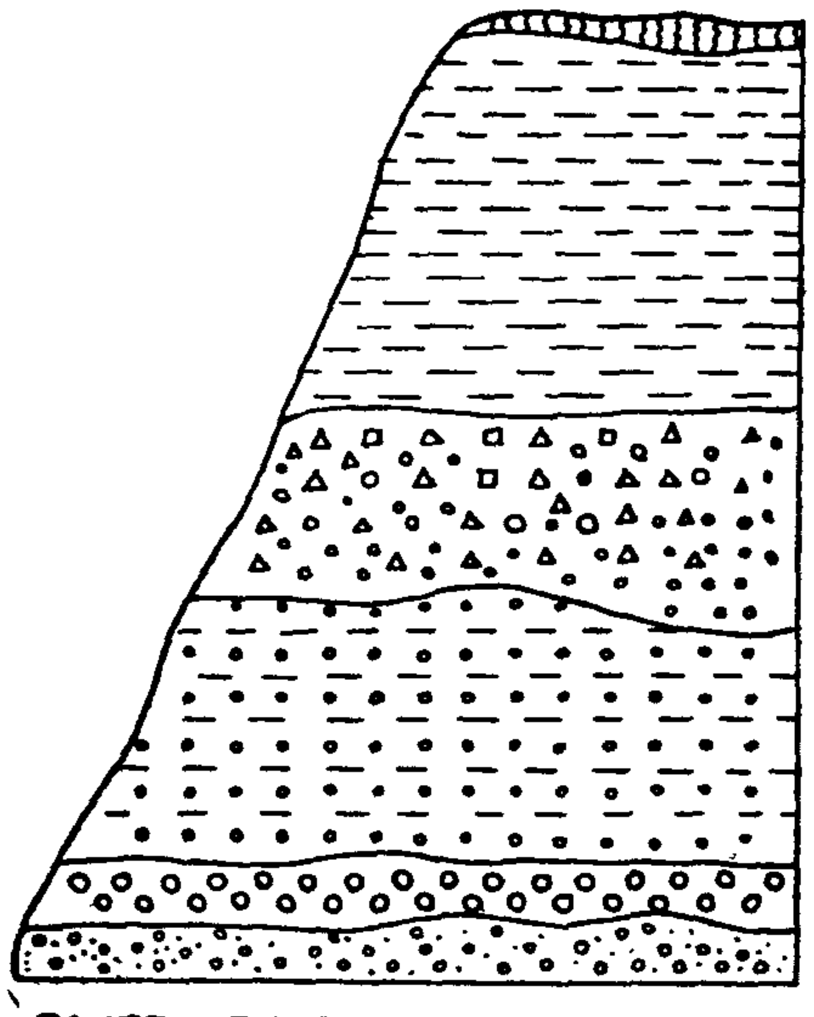
Palaeoliths have recently been reported from Bariyari, 14 miles to the east of Kausambi on the right bank of a tributary of the Yamuna in Banda District.[45]

41. *JRAI*, XVII (1888), pp. 57-65.
42. De TERRA and PATERSON, *op. cit.*, p. 313.
43. KRISHNASWAMI, V. D. and SOUNDARARAJAN, K. V., " The Lithic Tool-Industries of the Singrauli Basin, District Mirzapur," *A.I.*, No. 7, (1951), pp. 40-65. A few further discoveries are reported in *I.A.R.* 1959-60., p. 48.
44. *Ibid.*, p. 48.
45. *I.A.R.*, 1955-56, p. 4. The writer had an opportunity to examine the collections at Allahabad in 1959, owing to the courtesy of Professor G. R. SHARMA. A careful resurvey is necessary before arriving at any conclusion.



Diagrammatic section of the Rihand river midway between Kota and Pipri

Fig. 14



RIVER BAITARANI - RAMLA
ORISSA

Fig. 15

BIHAR

Largely due to its geological make up and want of field work, Bihar has hitherto given few glimpses of its Stone Age cultures, though from the earliest historical times it has dominated Indian History. Half or nearly half of the State consists of flat alluvial plains formed by the Ganges and its tributaries. It is a new land. The older land lies southward. It is the famous Chota Nagpur plateau, the home of the Mundas and other aboriginal tribes, primeval forests, and ancient rock formations, which now supply some of the most important raw material like coal, iron, copper, manganese, mica.

The plateau is a meeting point of the oldest rock formations like granite and gneiss and the comparatively younger Vindhyan sandstones, and the volcanic basalt. Since the last were deposited the land is undergoing sub-aerial denundation which is also accentuated by erosion during the monsoon. At places there is a thin cover of laterite. The major drainage system is from north-west to south-east, though a few small tributaries flow from north to south. To the former belong the Suvarnarekha, Brahmani and Baitarni; to the latter Kharkai, Sanjai and smaller streams like Kolhan, Iligara, Gamurgara, Roru.

Since the last century, the plateau is divided into four districts—Palamau, Hazaribagh, Ranchi and Singhbhum.

All these districts have occasionally yielded tools of various Stone as well as Copper Ages, but it is only very recently that some definite idea can be had of the earliest Stone Age, viz. the Palaeolithic. Those reported by BEECHING, BALL, and ANDERSON[46] and even FEARNSIDES[47] in absence of proper geological context and description cannot be assigned to this period, though from ANDERSON's drawings—which are indeed excellent for the time (1917)—there is no doubt that there are some genuine palaeoliths (Pl. II, Nos. 21-24) in his collection. And if the skull of a horse which he found in the huge solid clay deposit at a depth of 18 ft. from the surface overlooking the Binjai river, does indeed belong to a fossil (wild) horse, then the region gains an added significance. For the tools might be dated with fossil evidence.

Roro Valley

Acting upon these old clues, Shri SEN and his pupils from the Calcutta University carried out a brief survey around Chaibasa, near Chakradharpur (a station on the Nagpur-Calcutta railway line) in the Singhbhum District.[48] Here on the left bank of the Roro, near Tilimdah, three alluvial terraces at the height of 60 ft., 40 ft., and 20 ft., respectively, were observed. The topmost and the middle terraces are old and covered with a gravel spread, the topmost being implementiferrous. This gravel is at places overlain by a thin yellowish soil, and underlain by a layer of *murum*.

46. ANDERSON, C. W., *JBROS*, III, 1917, pp. 344-62. and Pls. I—IX.

47. A single tool called a "biface" was found from a loose deposit, near Hat Gampharia in 1938. It is cited by SEN (see, foot-note 48). However, there is no true "loess" in the region, and so what is described as such seems to be a thick silt deposit.

48. SEN, DHARANI and GHOSH, ASOK KUMAR, "On the occurrence of Palaeoliths in Singhbhum," *MI.*, Vol. 40 (1960), p. 168.

Stratigraphy

The stratigraphy is further clarified by a quarry section at Lupunggatu near Chaibasa.[49] Here a thick steatite bed (1) is overlain respectively by large boulders (2) smaller gravels (3) red murum and (4) yellowish sandy soil.

From this would appear that the highest and the oldest terrace might be equated with the pebble or boulder gravel bed in the quarry. Similar observation was also made by ANDERSON.[50] The highest terrace which is the main source of tools today, might have been formed when the Roro and other rivers flowed at that height (as elsewhere in India), or its present high level is due to uplift of the land. Whatever it is, the valley is undergoing erosion, and the stream is entrenched in a narrow channel today.

Tools

In all 35 tools of varied material were collected (from the surface of the topmost terrace and terrace II) around Chaibasa. It is interesting to note that jasper[51] among others—like quartz, quartzite, sandstone and basalt—was the preferred material as it was easily available in the form of pebbles, and also because its quarries are nearby, and not necessarily because, as argued by SEN, that it gives a good conchoidal fracture. The tools include : (*i*) Pebble-butted hand-axe ;[52] (*ii*) Abbevillian and Acheulian type hand-axes and cleavers with straight and oblique edges ; (*iii*) Bifacial chopping tool ; (*iv*) Flakes (including choppers).

Though it is really premature to argue statistically on the strength of 35 tools, the main tendency seems to be to make tools directly on pebbles or their cores after trimming the former and not on flakes. The character of the industry is Abbevillio-Acheulian.

Almost a similar number of tools and of the same character has been reported from the area of Nimidh[53] station in south Manbhum, but not yet described.

Thus while South Bihar seems to form a part of the Hand-axe Culture complex, though much cannot be said about the climatic conditions in which man lived, the discovery of a few tools from Bhimbandh,[54] near the eastern side of a hot spring and from the bed of a local stream in the Monghyr District is indeed very interesting. For this looks like a palaeolithic oasis in the sandy plains of North Bihar. But it raises the hope that other streams, including the Gandaki[55] further northwards in its higher reaches, where it flows through the the Nepal terrain, might yield a fully-developed hand-axe culture.

49. SEN, *op. cit.*, p. 182, fig. III.

50. *Op. cit.*, p. 351, and DUNN in *MGSI.*, LXII.

51. On this, see MOHAPATRA, G. C., *MI*, Vol. 41 (1961), p. 54.

52. SEN calls it a 'pebble-tool,' but this extension of the term to a biface is indeed wrong, and confusing to a layman.

53. *Science and Culture*, Vol. 17, No. 4, p. 164. The tools are in the Anthropology Department, University of Calcutta.

54. BOSE, N. K., and others, *MI.*, Vol. 40, p. 69.

55. A survey of this was proposed to the late Dr. A. S. ALTEKAR by the writer in 1959, when the latter was invited to assist in a prehistoric survey of Bihar by the Patna Government at the instance of Jayaswal Research Institute. However, a recent survey by Dr. JOSHI, is reported not to have yielded any tools.

Fig. 13. Stone Age Sites, Kangsabati Valley, West Bengal

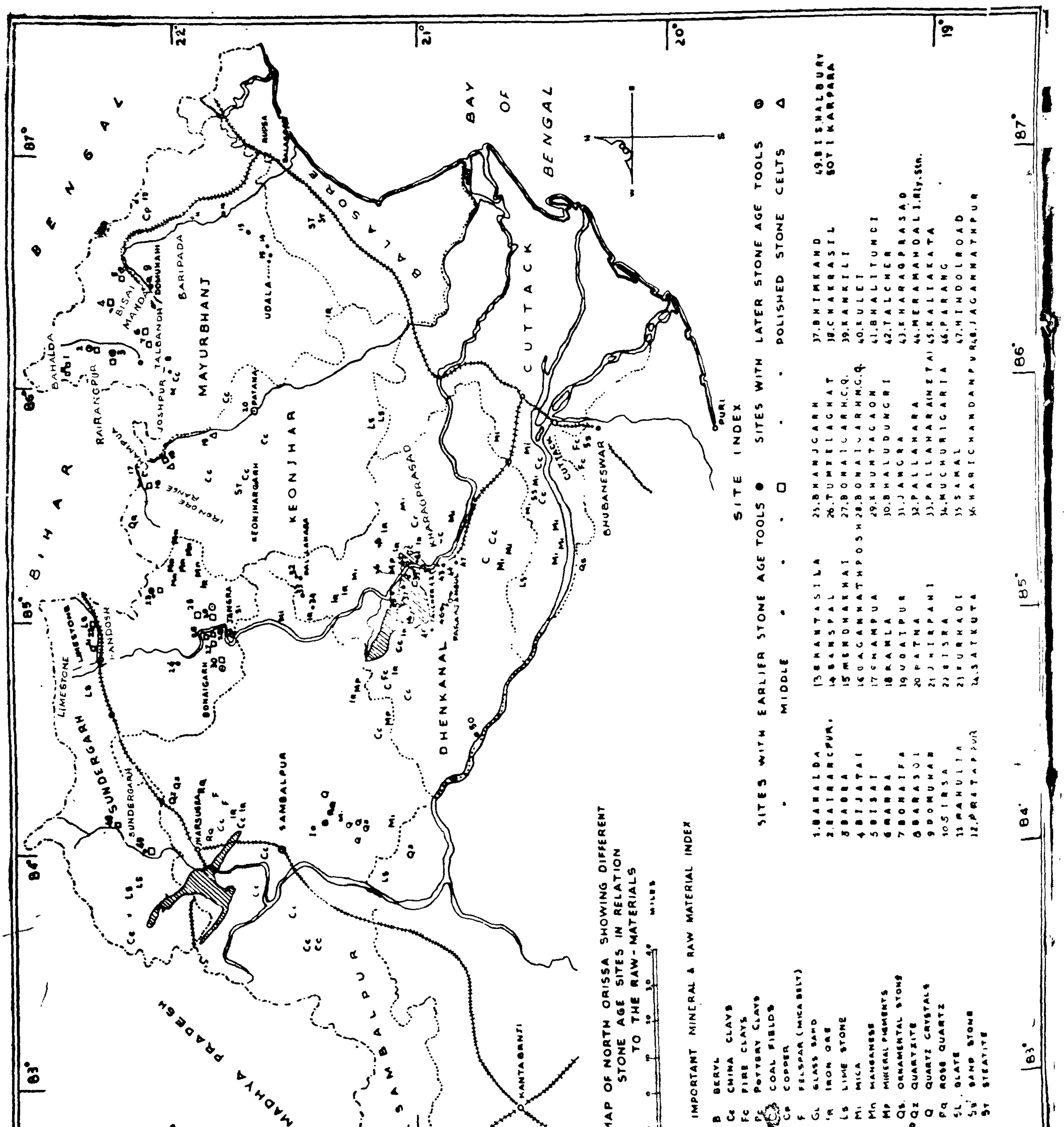


Fig. 14 North Orissa Showing Stone Age Sites

The Bhimbandh tools are from the surface and include peariform and ovate hand-axes and discoids on quartzite.[55a]

West Bengal

Kangsabati Valley (See Fig. 13)

Much of Bengal consists of the thick deposits of sand and silt which the Ganges and its tributaries bring down every year from the Himalayas. To this the sea also contributes. Thus out of 15 districts of West Bengal, leaving out the northern-most hilly districts, more than one-third of the south-eastern portion is nothing but low, coastal and deltaic. However, the area adjoining Chota Nagpur in Bihar and the highlands of Orissa is really a continuation of the same land forms. This had never been archaeologically examined, though the adjoining districts of Burdwan on the right, Ranchi and others in Bihar had yielded Stone Age tools. A very recent survey[56] of the Kasi (Kangasabti) valley with its tributaries—the Kumari and Jam in the districts of Bankura and Purulia[57] have yielded traces of several Stone Age cultures. Some 17 Early Palaeolithic sites occur on the Jam and 15 on the Kumari. Of these, Baddih, Hatikheda and Cheda seem to be sites where the palaeoliths—stained red and of dyke quartzite, pebble-butted but flat hand-axes, a few ovates and cleavers—were found *in situ* gravel which is about 5 ft. thick.

Orissa (*See Fig. 14*)

Prof. Bose and Shri Sen of the Calcutta University have been working in Mayurbhanj since 1939 on the clues given by Worman and others. This district—formerly a state—is situated on the northern border of Orissa, at the trijunction of Bengal, Bihar and Orissa. Dr. G. C. Mohapatra of the Deccan College between 1957-59 extensively surveyed the valleys of Brahmani and its tributaries in the rest of northern Orissa. The area to the south of the Mahanadi which divides Orissa into two has not yet been examined.

However, it may be said that practically the whole of Orissa had witnessed the dawn of Stone Age. Bose and Sen's earlier observations tended to show that Orissa had experienced the same climatic fluctuations which had been formerly observed further south-eastward in Andhra and Madras. Their later investigations suggest that the various deposits at Kamarpal on the river Burhabalang are not the product of a cycle of dry and wet phases. For these are not found over a long stretch of the river and might therefore be due to some local phenomenon.

Burhabalang Valley

In Mayurbhanj this complication and uncertainty has resulted because the tools are found in a twofold context. All the earlier discoveries since 1875 by Ball were made in laterite, a hard brownish deposit believed to have been formed owing to a period of heavy rain, followed by a dry period (as in Western

55a. Palaeoliths have also been reported from Raja-Pokhar, Bhalijore and Rajdot in Bhagalpur District *I.A.R.*, 1960-61, p. 57.

56. *I.A.R.*, 1959-60, p. 48.

57. Before the re-organization of the States, these districts, particularly Purulia, were part of Bihar,

India today, especially Mahableshwar and Matheran or the Konkan). Subsequent discoveries were made in the river gravels, as elsewhere. The most important site is Kamarpal on the Burhabalang in the former state of Mayurbhanj. The cliff section is as follows : III. Thick alluvium or silt (old). II. Boulder conglomerate with laterite pellets below at some places. I. Greyish blue clay overlying a hard, calcareous bed. (The clay contains a few plant fossils).

At Mukramatia and Mahulia, however, the basal deposits consisting of shale and limestone occur. These were believed to be geologically very early—Miocene. But now some fossils have been detected in the shale band which suggests a Lower Pleistocene age for the formation.

Evolution in Industry

If these observations which are still tentative are confirmed by further work then it will have a great significance for the Palaeolithic industry of Orissa. For if we now turn to the tools found from Kamarpal and Kuliana it is said that: (*i*) a majority of the tools from the boulder conglomerate were made on ovalish pebbles by removing a few flakes ; (*ii*) the hand-axes or bifaces were also crudely made, only showing more work ; (*iii*) these hand-axes showed further improvement and resemble Acheulian ones.[58]

Then there is a definite typological evolution. The only weak point in this is that we are not sure whether the lower part of the boulder conglomerate *does not contain any* evolved hand-axes. Were it to contain *only* pebble tools as at Olduvai in East Africa it could have been definitely asserted that in Orissa we have a development of the hand-axe industry from the pebble tools which might be dated to the Lower Pleistocene. As yet there is no site in India where we have undisputed data for such an earlier dating and such evolution.

Brahmani Basin

However, MOHAPATRA's[59] work covering some five districts—Dhenkanal, Sundergadh, Sambalpur, Keonjhar and Mayurbhanj—in the Brahmani and several other rivers, as well as an independent study of the sections along the Burhabalang in Mayurbhanj seems to contradict those of BOSE and SEN. He finds " evidence of wet phases separated by three dry phases." (*See Fig. 15*)

Climatic Phases

I. The pleistocene climate starts with a highly wet phase (pluvial) when the primary laterites were formed. The man was absent during this stage.

II. Then follows a dry phase when the clayish layer was deposited in sluggish rivers (according to BOSE and SEN man's tools might be found in this bed).

III. A wet phase followed when rivers *first* brought boulders and gravels and later when the climate was becoming drier spread this load as sheet gravel.

58. Summarised from BOSE, NIRMAL KUMAR, " Geological and Cultural Evidences of the Stone Age in Mayurbhanj," *Man in India*, Vol. 38, pp. 49-55.

59. MOHAPATRA, G. C., *The Stone Age Cultures of Orissa*, Ph.D. thesis in Archaeology, 1960. Poona University and Deccan College Library. Now published by Deccan College, Poona, 1962.

This contains indubitable evidence of man, viz. his tools. These, however, are of a mixed nature—pebble-tools, choppers, crude and refined hand-axes as well as cleavers—all mostly on core, but rarely on flakes.

IV. In the next dry phase a thick deposit of silt was laid over the gravels. This got weathered giving a reddish appearance, whereas the gravels remaining under water were cemented.

V. During the following wet phase, the river deposited a thin layer of finer gravel over the existing deposit of gravel and silt. This fine gravel contains smaller tools as elsewhere in India and indicates the existence of a different kind of man and culture. It belongs to the Upper Pleistocene.

VI. Recent times—called Holocene—were heralded by a drier climate, when the previously deposited silts got weathered red. The present is a period of seasonal floods when the rivers deposit silt, sand and fine gravels in the basin of the river.[60]

Briefly Orissa had two Stone Ages in the Pleistocene : one Early or Old or Lower Palaeolithic, falling within the Middle Pleistocene (but not in the Lower) ; the other Middle Stone Age or Palaeolithic, belonging probably to Upper Pleistocene.

Tool Types and Stages

Since all the tools came from the same layer—either of secondary laterite, for instance, from the quarries at Kuliana[61] or from the conglomerate (called boulder) bed on the Burhabalang and other rivers it is not possible to classify stratigraphically the collection which includes : (1) Hand-axes, (*ii*) Irregularly flaked bifaces, (*iii*) Flakes, (*iv*) Scrapers, (*v*) Irregularly flaked pebbles, (*vi*) Cores, (*vii*) Points. Hence these are classified on the ground of technique and type in three stages.[62]

Stage I has tools—hand-axes primarily—which are crude, having a pebble butt, and shows large and deep flake scars, mainly from the tip, and irregular technique.

Stage II In this group, the tools are better made and there is the evidence of soft-hammer technique, because the flake scars are flatter and thinner. Cleavers appear for the first time.

Stage III The hand-axes are extremely well proportioned and made mostly by controlled and soft-hammer technique.

Bose and Sen also speak of choppers and seem to think that these are of Sohan-type. These, however, are so negligible in number and not at all characteristic of the culture as a whole. These in fact seem to form along with flakes an invariable concomitant of the hand-axe culture.

60. Bose and others' *op. cit.*, statement that the present river also carries huge boulders does not seem to be well founded. This is merely a re-deposit of the older material, that too at a short distance.

61. Bose, Nirmalkumar and Sen, Dharani, *Excavations in Mayurbhanj*, (University of Calcutta, 1948).

62. Mohapatra, *op. cit.*

MOHAPATRA makes a special mention of smaller tools, particularly hand-axes[62a] and points in Stages II and III respectively and infers that these herald the arrival of the Middle Stone Age Culture or tradition. While this may be so, it has got to be remembered that the collection is all one, and the presence of these highly advanced forms may suggest that it is a mixed collection, probably of a late period in the Lower Palaeolithic.

ANDHRA

When we leave Orissa and proceed further southwards we enter the classic land of Stone Age man. For all the districts of Andhra Pradesh, excepting East and West Godavari, and the sourthern districts of Madras State, have yielded numerous stone implements of several Stone Ages, since the last century. These along with Orissa and southern U.P. form the old land mass in India, older than the Himalayas and the entire Gangetic system, and the coastal plain of the east and west coast. And in these old areas, we have some of the oldest rock formations on the earth, which form the so-called Eastern Ghat. Their sub-ridges go by the name of the Nallamalais and Erramalais. But whether you see this ridge or that, everywhere the country presents an antique look; weathered reddish appearance and dried up, very shallow, narrow streams. This is particularly striking when one passes through the old granite land with an isolated boulder perched precariously upon another and about to fall at any moment. However, a little careful examination of the land shows that the country had seen much better times in the past, when the climate was much wetter and the rivers flowed in a much broader valley. Today, inspite of scanty and irregular rainfall, the farmers by skilfully creating artificial ponds and lakes eke out a living by having two crops a year. And their green paddy fields against a copper-red, treeless, hills look particularly charming.

Of the several districts of Andhra, Kurnool had suggested a fairly good sequence of Stone Age tools and climatic fluctuation based on the collection of CAMMIADE and interpretation by BURKITT,[63] which holds good for the whole of the south-east India. Since then the district has been more fully surveyed by Professor ISAAC[64] of the Andhra Christian College (previously a student of the Deccan College). The tools from Giddalur have been described in detail,[65] whereas the adjoining district of Guntur, Nagarjunakonda which was hitherto famous for its historic monuments has also yielded, relics of several earlier Stone Age and other cultures including the Palaeolithic.

It is interesting that all the evidence for the Stone Age in Kurnool is provided by the smaller rivers, which criss-cross the eastern half of the District, the most important being the Bhavanasi and its tributaries, then Gundalkama, whereas of the bigger rivers, the Tungabhadra skirts the district on the north at the town of Kurnool, whereas the Krishna flows through a deep gorge at Sri Sailam and passes on to Guntur. (*See Fig. 16*)

62a. These are being found elsewhere in India as well, and were also found in England in the last century.

63. *Antiquity*, Vol. IV, 1930, pp. 327-49.

64. *Stone Age Cultures of Kurnool*, a Ph.D. thesis in Archaeology, 1960, Poona University and Deccan College Libraries. The writer had the opportunity to examine a few sites with Prof. ISAAC.

65. SOUNDARA RAJAN, "Stone Age Industries near Giddalur," *A.I.*, No. 8, pp. 66-92.

The data for the Early Stone Age comes from river gravels and as in Orissa and Madras from detrital laterite. The latter indicates that the man was not present when the laterite was formed owing to a period of much heavier rainfall than today. But subsequently when this was being eroded under another wet phase the tools of man who had lived on the laterite surface got embedded in this washed out material. Hence the tools are heavily stained with a brownish tint.

Bhavanasi and other rivers

The same story is told by the several rivers—the chief among those examined are the Bhavanasi near Krishnapuram on the Dornala-Atmakur road, the Tigaleru at Doranala and in the upper reaches at Chintapalli, about 3 miles from Tokapalli, the Ralla Vagu at Erragondapalam, the Kandleru a tributary of the Gundalkamma, the Sagileru and its tributary Enumaleru around Giddalur and then finally the Tungabhadra at Kurnool. All these rivers flowed in a much broader bed between the two ridges of the Eastern Nallamalai in the Middle Pleistocene times, though they are now reduced to small streams. They deposited their load of pebbles over the shale, which in this region forms the basal rock. This was further covered by a 10 feet of silt, which is now weathered red and constitutes the top of terrace I at Chintapalli, for instance. At Kurnool on the other hand, the topmost terrace is very high, nearly 80 feet.[66]

In the next wet and dry phase, this old deposit was partly eroded and covered with a whitish kankary and fine silt. This deposit forms Terrace II and contains Series II tools. At Kurnool, or properly Tandrapadu, opposite the town in the district of Mahabubnagar, this second terrace is nearly 60 feet high and covered with smaller gravels. (*See Fig. 17*)

Stratigraphic and Climatic Correlation

It thus seems that in Kurnool we have at least two cycles of wet and dry phases after the formation of the laterite. A typical section on the smaller rivers will be as follows :[67]

Upper Pleistocene	Finer Gravels not lateritized	Tools of Series II	Wet Phase V
	Gravels and clays	Advanced Hand-axes and Levallois Flakes	Dry Phase IV
Middle Pleistocene	River Gravels	End of Hand-axes of Period I	Strong Wet Phase III
	Open Plain	Hand-axes of Period I	Dry Phase II
Early Pleistocene	Laterite formation on East Coast	No tools. Man absent	Long wet Phase I.

In effect we come to the same correlation of the tools, the deposits and the climatic oscillations as observed elsewhere.

66. These observations are very briefly recorded in *I.A.R.*, 1959-60, p. 11.

67. This is adopted with slight variations, leaving out the terms Sohan etc., from KRISHNASWAMI , V D, "Stone Age India, " *A.I.*, No. 3, p. 32.

So far most of the tool collections are from the surface and though they have been scientifically classified into various groups on the basis of physical condition, form and technique, the observations of BURKITT and CAMMIADE have been further confirmed by those of later observers viz. that in the lowest or earliest gravel or pebble conglomerate itself one finds a typologically highly advanced tool like an Acheulian hand-axe with a pebble butted one. Thus a stratigraphic division of the industry is not available as elsewhere in India.

Giddalur Tools

Thus the tools from Giddalur,[68] for instance, are classified into 12 or 13 groups as follows :

1. Pebble tools, 2. Rostrocarinates 3. Victoria West 4. Abbevillio-Acheulian hand-axes, 5. Acheulian hand-axes, 6. Ovoids, 7. Cleavers (of various types), 8. Clactonian flakes. 9. Scrapers on Clactonian flakes, 10. Proto-Levallois flakes, 11. Levallois flakes, 12. Cores and Core scrapers, 13. Bladish flakes, 14. Coarse *burinate tools.*

This is certainly a very mixed bag and Nos. 11, 13 and 14 are indeed later as ISAAC's observation of several stratified sections in the District indicates. They belong to the second gravel deposit which is generally finer and not so well cemented.

Pebble Tools : Significance

So far the tools are concerned the pebble tools form an appreciable number, about 40 per cent in ISAAC's very large collections. And if these are regarded as Sohanian or suggesting Sohan's influence so far south as Kurnool, then the question may be asked if the Sohan itself had not an independent origin at several places.[69a] The more appropriate explanation seems to be that these pebble tools, as in South and East Africa, formed either the substratum or the invariable concomitant of the hand-axe industry.

The hand-axes are indeed fine and of varied shape, whereas some of the cleavers on the single or double Vaal technique provide, as SOUNDARA RAJAN says, text-book illustrations.[70] These as well as the Proto-rostrocarinates recall similar tools from South Africa, Rhodesia etc.

The Levallois flakes etc. will be discussed later on the chapter on Middle Stone Age Cultures.

Krishna Valley

At Nagarjunakonda[71] in the Krishna Valley, District Guntur, an interesting series of industries—pebble tools, hand-axes, Levallois cores and flakes,

68. SOUNDARA RAJAN, *op. cit.*, p. 73.

69. Even at Giddalur, Locality I of SOUNDARA RAJAN, which includes the factory site between the 80th–81st milestone, the writer along with ISAAC picked up several Levallois flakes – though these do not figure in RAJAN's inventory – and it further appeared to him that here one could see the transition from Lower Palaeolithic to Middle Palaeolithic. See also *I.A.R*, 1959-60, p. 11 for Dr. KHATRIS' observation which seems to be at variance with those of ours. See also *I.A.R.*, 1960–61, p. 1.

69*a*. See also *A.I.*, No. 17, 1961, pp. 70, 75 and MENGHIN in *Eary Man* ed. G. G. MACCURDY, 1937, p. 312.

70. *Ibid.*, p. 70, Fig. 4, 14-15, Pl. XVIII, 14-15.

71. SOUNDARA RAJAN, " Studies in the Stone Age of Nagarjunakonda and its Neighbourhood, " *A.I.*, No. 14, (1958), pp. 49-113.

blades, microliths and polished axes—covering the long period from Lower Palaeolithic to the Neolithic was discovered by SOUNDARA RAJAN. From the distribution of the various industries in different localities having varied physiographical features a number of important inferences are made :

(*i*) that these industries indicate almost continuous occupation by man right from the Middle Pleistocene times.

(*ii*) that the people manufacturing blades lived on the higher ground, slightly away from the river, as they were self-contained so far as the raw material was concerned, and that this happened after the hand-axe people had cleared the forest and moved into the interior.

(*iii*) that the folk making pebble tools only (as evidenced by Karempudi) lived on the banks of the tributaries of the Krishna viz. Naguleru etc., whereas the hand-axe folk (who might have come a little later) with their improved tools ventured to move into the forested parts of the valley.

(*iv*) that thus there is a possibility of the pebble tools being earlier than the hand-axes.

(*i*) that a section of the nala suggests three cycles of wet and dry phases. The earliest hand-axes belong to the first wet phase, when the coarse heavy gravels were deposited on the rock.

In this section our attention will be confined mainly to the Lower Palaeolithic cultures and the environment of man. Before offering any comments a little detailed description of the region is necessary. There are two main sites. (*I*) Karempudi, a site 32 miles to the east-south-east of Nagarjunakonda, on the Naguleru river, (*II*) Nagarjunakonda, on the Krishna.

Karempudi

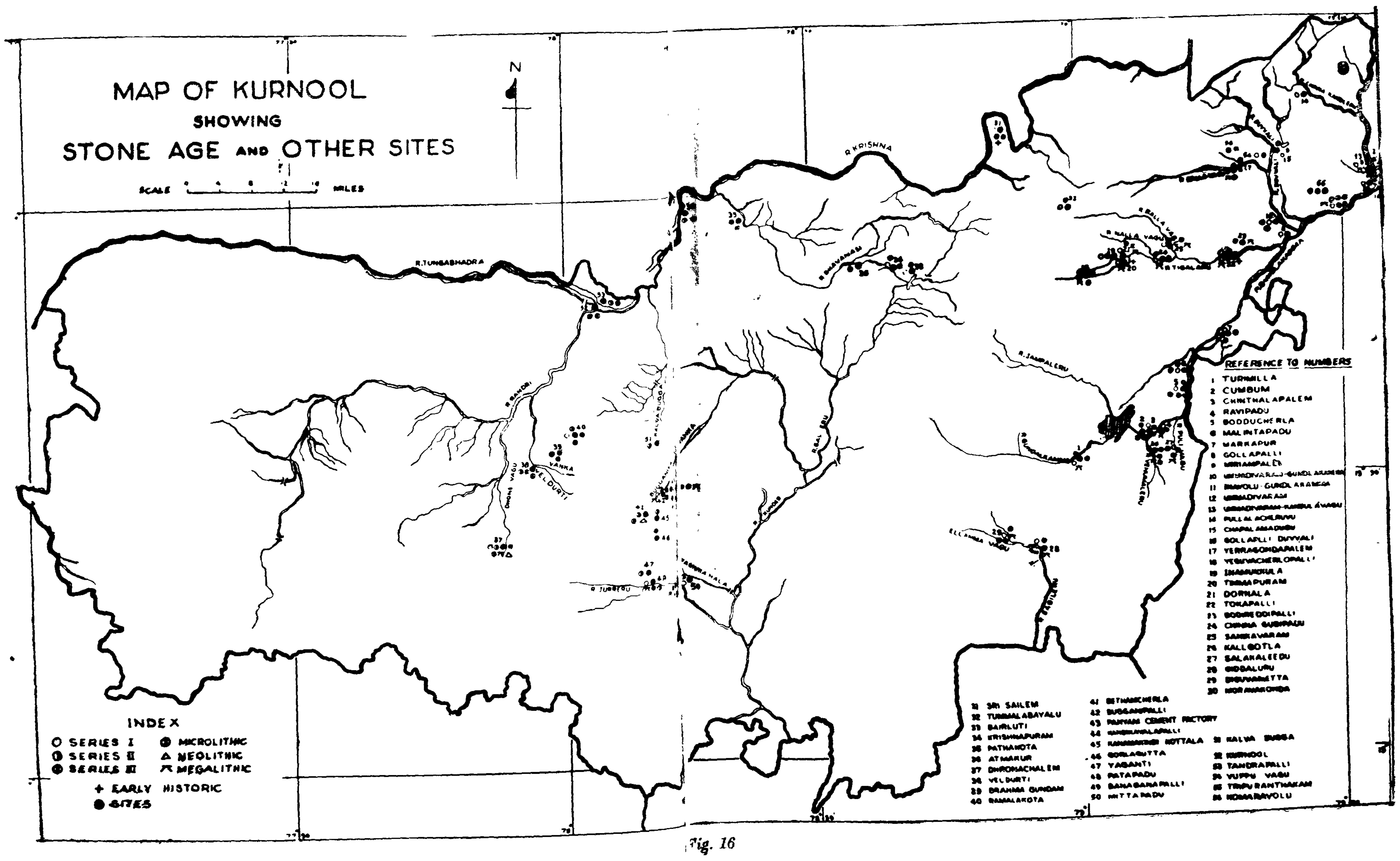
Here there are five tool-bearing localities of which Locality I is on the eastern affluent of the river, whereas Localities II-V are on the main river.

Locality I yielded 24 tools, of which some have a pebble cortex, and include besides pebble tools crude Early Abbevillian hand-axes and heavy Clactonian flakes and one tool on a Victoria West technique.

Locality II gave 25 tools and the rest 10.

These 25 tools comprise advanced hand-axes, proto-Levallois and Levallois flakes.

Until a much larger stratified collection is available, it would appear the conclusion, on the strength of 25 tools from Locality I, that there is justification for the earlier existence of a pebble-tool culture or industry at Karempudi as in the Olduvai or East Africa is a little far-fetched, particularly when this small collection itself includes crude hand-axes. Unless there is clear, exclusive occurrence of pebble tools as at Olduvai and at a number of localities on the same river, such an important cultural stage should not be postulated.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3 CHINTHALAPALEM
4 RAVIPADU
5 BODDUCHERLA
6 MALINTAPADU
7 MARKAPUR
8 GOLLAPALLI
17 YERRAGONDAPALEM
20 TIMMAPURAM
21 DORNALA
22 TOKAPALLI
26 KALLGOTLA
27 SALAKALEEDU
31 SRI SAILEM
32 TUMMALABAYALU
33 BAIRLUTI
36 ATMAKUR
38 VELDURTI
39 BRAHMA GUNDAM
45 KOTTALA
47 YAGANTI
49 BANAGANAPALLI
52 KURNOOL
53 TANDRAPALLI
54 VUPPU VAGU
55 TRIPURANTHAKAM

Fig. 16

Nagarjunakonda

At Nagarjunakonda, there are six localities (A-E). No terraces—that is evidence of previous or earlier high river beds—seem to be there, as the Krishna flows through a rocky terrain.

The localities spread over an area of some 4 square miles from the north-east to the north-south, and on the eastern or right hand side have yielded a varied assemblage of tools. Thus

Locality A 42 ft. above the river bed, contains Abbevillio-Acheulian hand-axes, cleavers, some pebble tools, but no Levallois flakes.

Locality B 22 ft. above the river bed, and south-west of Locality A, only flakes and flake tools of Levallois industry.

Locality C is in a nala at the south-east foot of the Nagarjuna hill, and has a stratified 18 ft. section. The loose gravel block from the highly cemented gravel basal bed gave three tools—an incomplete Early Acheulian hand-axe and two scrapers.

Locality D immediately overlooking the river on a slightly elevated slope gave *mostly* pebble tools and high bulbed Clactonian flakes and occasional hand-axes.

Locality E, about ½ a mile away from the river, at the foot of the Tellarabodu hill an assemblage of blade flakes and burins and scrapers of an Upper Palaeolithic nature.

Locality (F ? though not so named), but far down in the south a nala near Lamadigudem in the gravels was noticed a Clactonian industry having flakes with high plain striking platform and early Abbevillian type hand-axes.

Of these six localities, only Locality C has really stratified deposits on the strength of which something about the past climate can be gleaned. The 18 ft. section comprises a sequence of gravel-silt, gravel-silt and gravel-silt, the top being a thick deposit of bunded earth. While this does indicate three wet and three dry phases, it is interesting to note that SOUNDARA RAJAN[72] assigns the gravels to a dry and the silt to a wet phase !! Normally the silt proper is believed to be laid down in a drier climate when the river was aggrading and the gravels spread under a wetter phase.

The tools, however, from this section are only three and are indeed not helpful in saying anything about a particular cultural phase or the succession of industries in the Valley.

Independent chronological evolution

Regarding the occurrence of widely different tool complexes in Localities A, B, D, E, F, leaving out E, it may be said that unless an undisputed, exclusive, stratigraphical succession of pebble tools, Clactonian flakes, hand-axes and Levallois flakes is available, to postulate a separate and even chronological existence of different groups of people seems to be unwarranted, especially when SOUNDARA RAJAN himself says later,[73] " the Palaeolithic folk need not have been tied down to one single trend only, but could have experimented with many techniques

72. *Ibid.*, p. 57.
73. *Ibid.*, p. 81.

simultaneously for the fabrication of tools, particularly in the incipient stages of tool-making." It is even argued[74] after BORDES that "the Levalloisian is not necessarily a later cultural development, but one of the two basic flaking techniques often in use at one and the same time." The latter observation is no doubt true; the Levalloisian may coexist with the Clactonian, once it is known. But is it of equal cultural antiquity as the Clactonian or the purely pebble tool technique? More important is the fact that if we accept SOUNDARA RAJAN's earlier suggestion fully, all our inferences based on technique are of little chronological significance!!

These inferences do signify a cultural evolution of the man and his techniques, even new cultural forces, when these are borne out by undisputed stratigraphical data and relatively ample tools.

As for Nagarjunakonda and its neighbourhood Karempudi are concerned, we may conclude that the present data do not suggest any chronological evolution from a pebble tool culture to the advanced hand-axe culture, but as SOUNDAR RAJAN has himself concluded the pebble tools seem to be an essential component of the bifacial or hand-axe culture. Further that, as has been well argued by him, that these pebble tools with a jagged wavy edge and called "chopping tools" do not show any Sohan influence as distribution maps of pebble tools are likely to imply, but are an invariable component, wherever hand-axes are made on pebbles.

Hence it is not possible to agree with SOUNDAR RAJAN that within the same valley Localities A, B and D and F show, with our limited knowledge of tool complexes, that the man first occupied Locality D and then F and later A, B. For if the different tool assemblages do not show any chronological development, but are likely to be contemporary, then differences might be due to the availability of raw material and, as SOUNDER RAJAN himself says, simultaneous experimentation with various techniques.

The small excavation in the north-western part of the valley during 1959-60 yielded cleavers in the lowest layer below a pebbly layer, whereas layer 6 yielded a core and layer 5 hand-axe, whereas from layer 4 came blade-flake. This sequence is indeed very suggestive, but from a small dig nothing very much can be inferred. In particular layers 7, 6 and 5 seem to be of similar composition from the drawing and photographs.[76]

MADRAS

Kortalayar Valley

Further south,[77] around Madras where the first discoveries were made by Bruce FOOTE in 1863 the work by PATERSON[78] and KRISHNASWAMI[79] has clarified

74. *Ibid.*, p. 81, fn. 1.
75. *Ibid.*, p. 85.
76. *I.A.R.*, 1959-60, p. 5, Fig. 2 and Pl. I. A, B. C. Palaeoliths have also been found in Nalgonda and Chittoor District, *I.A.R.*, 1960-61, p. 57.
77. For work in Nellore *etc.* See below.
78. De TERRA and PATERSON. *op. cit.*, pp. 327-30.
79. KRISHNASWAMI, V. D. "Changes of Prehistoric Man near Madras," *Journal of Madras Geographical Association*. Vol. XIII (1938), pp. 58-90, and "Prehistoric man round Madras," *Indian Academy of Sciences*, Madras 1938, No. 3, pp. 32-35.

the general picture of the Early Stone Age Cultures. Here the coastal plain was formed by laterite as in Orissa and elsewhere on the East Coast during the Early Pleistocene times. Over this was deposited by the Kortalayar or the old Palar river a white boulder conglomerate as at Vadamadurai. This was covered by the detrital laterite. The old river valley was then dissected and three terraces at a height of 60, 20 and 8 feet respectively were created. With these and the earlier boulder conglomerate the tools were related and thus an evolution in the Early Palaeolithic Culture is postulated.

Sequence of Cultures

1. Primary Laterite Plain : sterile
2. Boulder Conglomerate with Three Groups of tools as under :

Earliest Group : Non-latertized, with heavy cream-coloured patination. Tools rolled but divisible into
(*a*) *Early Series.* Abbevillian hand-axes with pebble butt and crude and irregular flaking.
(*b*) *Late Series.* Less patinated Hand-axes of Early Acheulian type, marked by "step flaking."

Second group : Tools stained red, but not patinated; Fine-Acheulian hand-axes. Pear and ovate shapes appear;

Third group : No laterite staining; Hand-axes by cylinder hammer technique, ovates with flat step flaking. A few cleavers.

3. Attirampakkam Terrace : Along with early forms of hand-axes which are generally rolled, very late Acheulian types of hand-axes—thin, flat, elongated and made on flakes.

Some of these even recall Micoquian of France. In addition to these hand-axes there are cleavers of all types, some exhibiting Vaal technique and cores and flakes after the Sohan technique.

The top of the loam yields Levallois-like flakes with faceted platform and much primary flaking on the upper surface.

Two things may be noted in this sequence of cultures. First, that no stratigraphical evidence is available for the various groups of tools in the Boulder Conglomerate. Even in the Earliest group we see a mixture of Abbevillio-Acheulian elements. This is exactly the position elsewhere in the Handaxe World in India. We do not see, as in East Africa, the steps by which the hand-axes evolved out of the earlier types—pebble tools. Secondly, nowhere a reference is made to Series II and other types of tools. These should now be searched for in the loam and later terraces in the Kortalayar Valley.[80]

80. These have now been found by the late Dr. SUBBARAO and the writer had the opportunity to handle them at Baroda. As for the laterite, it is not correct to say that the primary laterite is implementiferous, either in Madras or in Orissa, as KRISHNASWAMI's statement seems to suggest. *A.I.* No. 3, p. 34. In both the regions this is probably Early Pleistocene, but it is the detrital laterite of Middle Pleistocene times which yields tools. The laterite needs an independent study and should not be dated here and there with the help of tools.

No stratigraphical work has yet been done in other districts of Andhra viz. West and East Godavari, Krishna, Nellore, Anantpur and Cuddapah as well as those of Madras such as Chittoor (?)[80a] North and South Arcot, Madura and Trichinopoly (Tiruchirappalli). But everywhere FOOTE[81] had collected palaeoliths either from the derived laterite beds or the gravel (shingle) beds of rivers. Since then other collections have been made; of these the MANLEY Collection from Nellore has been described in detail by AIYAPPAN.[82]

It therefore seems certain that except the West Godavari District in the North and the Tinnevelly in the South, Early Man flourished all over south-east India.

KERALA

Turning to the west coast, Kerala and Malabar have so far not yielded any palaeoliths, probably because no search has been made. But it is likely that here there are ancient sea beaches, as there are further up near Bombay, which on examination might be found to be implementiferous. Or it may be that the coastal belt is of recent growth. Thus the reasons for the absence of palaeoliths might be truly geographical.

MYSORE

Further up we come to Mysore. This is a plateau of great environmental contrasts.[83] The western parts get more rain, because they are elevated or lie within the direct monsoon belt, whereas the eastern like Chitaldurg are semi-arid. Three major rivers, all flowing from west to east, the Kaveri in the south, the Tungabhadra in the north and the two Pennars and the Palar in the east drain Mysore. Geologically too, almost all the important formations, save sandstone and trap, are met with in the region.

FOOTE had discovered palaeoliths at some sites in the Shimoga District, viz. Kadur, Nyamti, Nidaghatta and Lingadahalli.[84] Since then a few more have been reported, but none in stratified context. So a fuller idea of the palaeolithic times cannot be had.

Kibbanahalli Tools

Recently SHESHADRI has described a palaeolithic industry from Kibbanahalli, District Tumkar, Mysore State.[85] It is supposed to be a palaeolithic settlement, but no river or stream in the vicinity has been mentioned, though water is said to be available in the adjoining valley. However, raw material was available in plenty and consists primarily of varieties of quartzite. Unfortunately all the tools seem to be from the surface or from an earth deposit, two

80a. Recently some tools have been found at Tirupati, *I.A.R.*, 1960-61, p. 57.

81. FOOTE'S work has been summarized in detail by SANKALIA, *Investigations into the Prehistoric Archaeology of Gujarat*, Baroda, 1946, p. 109.

82. *MASI.*, No. 68.

83. For a little more information, See SHESHADRI, M., *The Stone-Using Cultures of Prehistoric and Proto-Historic Mysore* (London 1956), pp. 1-7.

84. See SANKALIA, *Investigations*, p. 108.

85. SHESHADRI, M., " The Palaeolithic Industry of Kibbanahalli, Mysore State, " *Artibus Asiae*, Vol. XVIII, (1955), pp. 271-87.

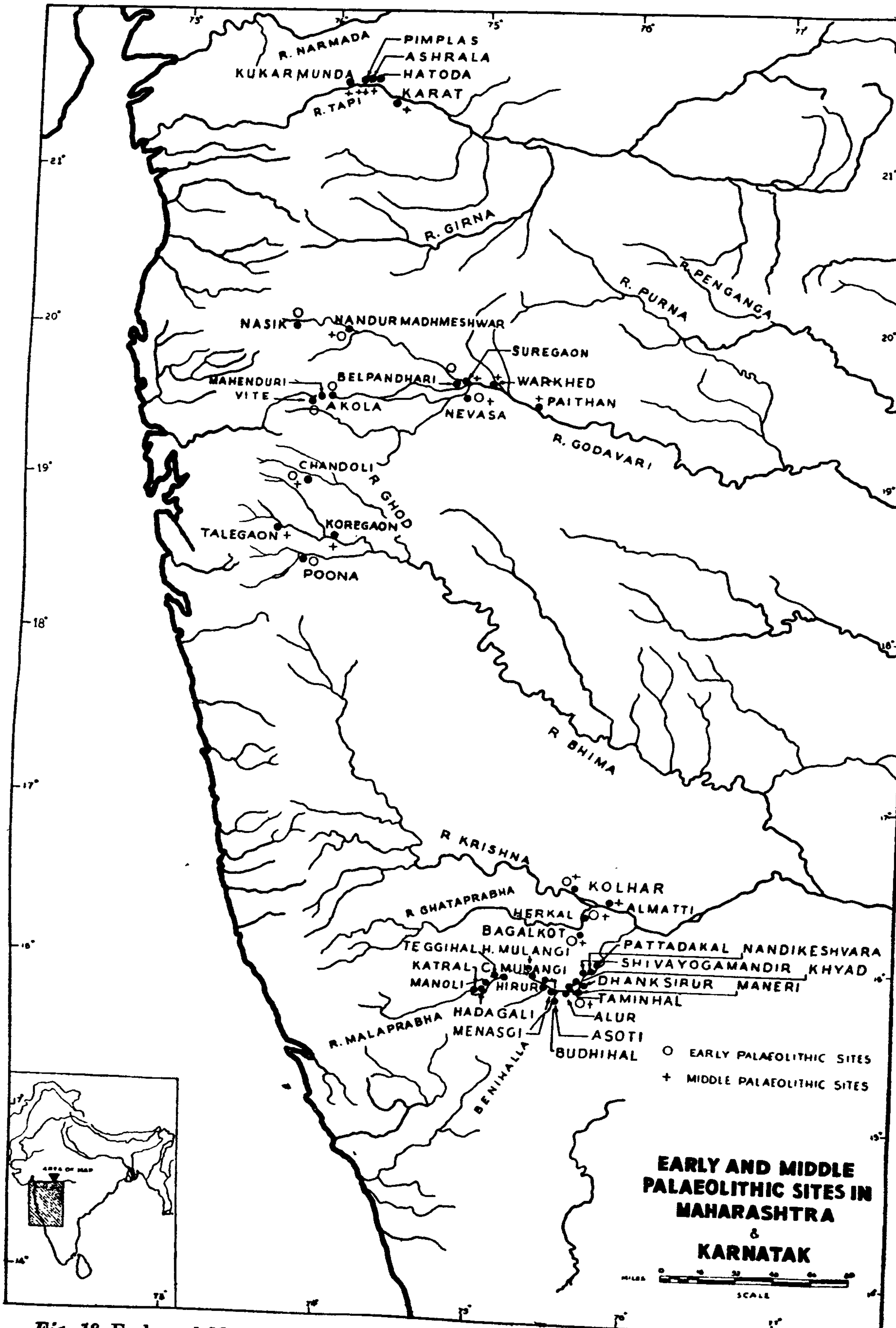


Fig. 18 Early and Middle Palaeolithic Sites in Maharashtra (Add sites in Chanda District) and Karnatak.

to eight feet thick. From the mixed nature of the collection comprising early Abbevillian and late Acheulian hand-axes, cleavers of all types, scrapers, choppers and chopping tools, " beaked tools " on Clactonian technique and regarded as a special feature of this industry, and small tools, recalling Series II, it seems to be a re-deposit. Typical Levallois flakes seem to be absent.

North Karnatak forms now a part of Mysore, from which it is not different linguistically and culturally and not much different either geographically. More or less the same division of wet and semi-arid zones obtain here, whereas the ancient rock formations in Dharwar, Belgaum and particularly in Bijapur offer excellent raw material in the shape of quartzite and sandstone with varied hues. In rare cases, even the intractable gneiss has been utilized by Early Man.

Malaprabha and Ghataprabha Basins (*See Fig. 18*)

The Krishna is the most important river, with its tributaries, the Malaprabha and Ghataprabha. FOOTE had mentioned two very rich sites, Khyad on the Malaprabha and Menasgi or Megur-Asoti on the Bennihalla, an affluent of this river. Since then JOSHI has surveyed the entire 200 miles of the river and noted some 21 sites.[86]

Later Angavadi and Bagalkot on the Ghataprabha have turned out to be rich sites, whereas stray finds have been reported from Herkal, Kolhar, Almatti on the Krishna, and Sivanandi, Nandikeshavara, Pattadkal, Shivayogamandir, near Badami. So far no discoveries have been made from the more wooded western districts,[88] including Dharwar proper. Presumably, these were avoided by Early Man, whereas the most favourite and " densely populated " areas seem to be the comparatively open valleys in the Bijapur District.[88a]

Stratigraphy

Stratigraphically, the most important sites are Hire Mulangi, Alur (Talakvad) and Taminhal in a nala on the left bank, two miles from Alur. The total height of the sections is nowhere more than 18 ft., the average being still less. A complete section at Taminhal for instance, consists of : Black Soil, Fine Gravel, Fine sand and Gravel, Buff or brown sand, Gravel conglomerate, Mottled Clay and Rock. (*See Fig. 19*)

Tool types

The mottled clay has not yielded any tools so far. It might be weathered rock, as it appears at Khyad or a deposit in shallow stagnant water. In the latter alternative it might indicate a drier climate. The gravel definitely stands for a wet phase and it was then that the Early Man lived on the banks of these rivers. All his tools are so far found in the gravel bed. Though these comprise Abbevillian and Acheulian types of hand-axes-pear shaped, ovate and cordate etc.—

86. JOSHI, R. V., *Pleistocene Studies in the Malaprabha Basin*, (Poona and Dharwar) 1955.

87. *I.A.R.*, 1955, 56, p. 5.

88. The site of Vanavasi which is situated on the Varada, was examined by the writer in 1956, but no tools could be found there.

88a. Further finds are reported in *I.A.R.*, 1960-61, p. 28.

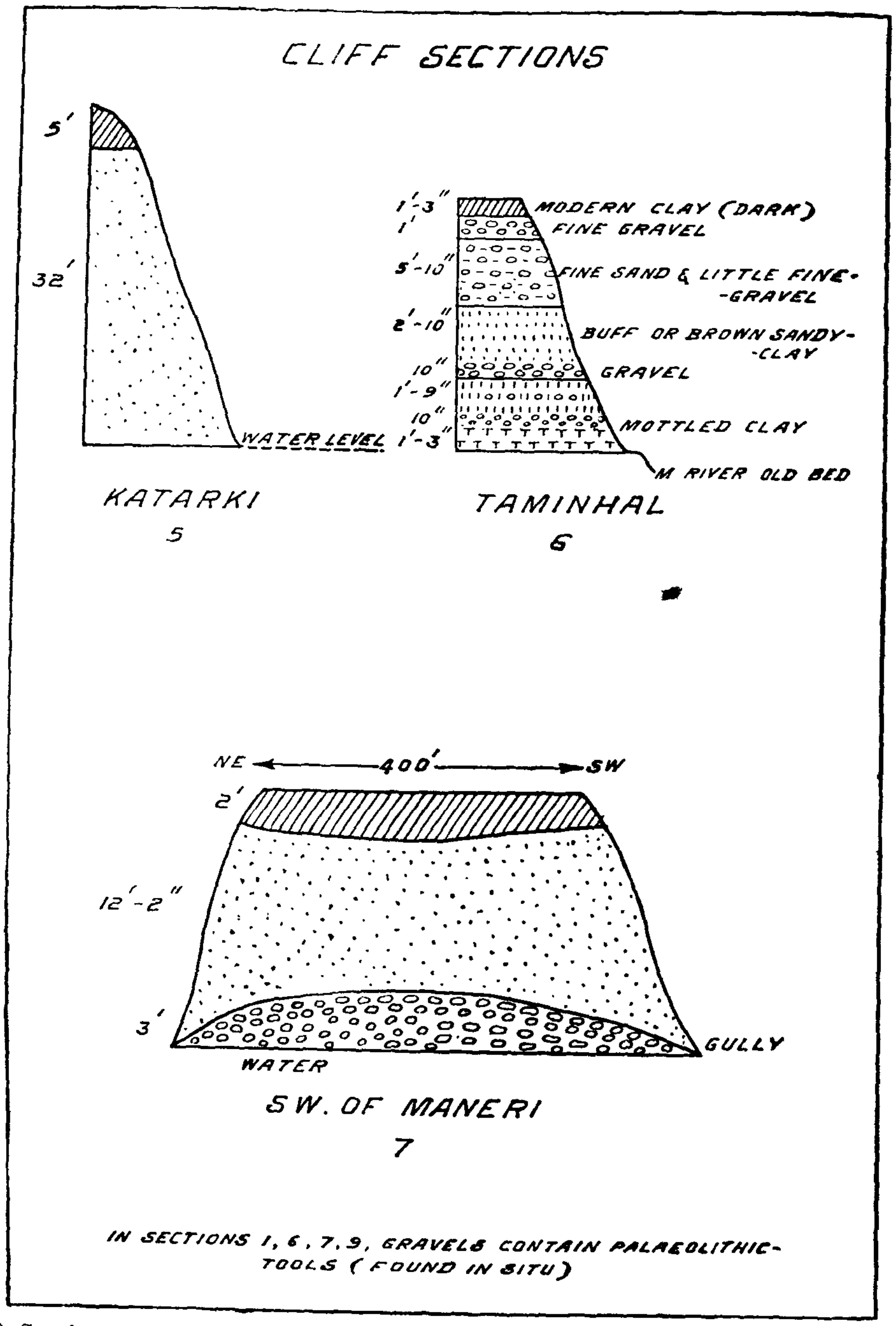


Fig. 19 Sections on the Malaprabha at Katarki, Taminhal and South-West of Maneri

the latter are in a majority.[89] Again hand-axes on cores or pebbles are comparatively very few. Two special types must be here mentioned. These are (*i*) chisel-edged and (*ii*) burin-type hand-axes.[90]

The cleavers are all made on flakes, and comprise some five types.[91] Both the hand-axes and cleavers have generally a biconvex section, and are marked by fine shallow surface trimming. And thus the Malaprabha Industry, though it contains a few other elements such as huge cores, choppers, core-scrapers, discoids, is on the whole more advanced Acheulian than either that of the Sabarmati or Mayurbhanj, for instance. The absence of a large number of pebble tools or pebble-butted hand-axes is indeed puzzling. This might be due to the absence of small-sized pebbles and the presence of huge boulders, which as Joshi suggests,[92] were broken on block-on-block method on the spot, and later the flakes were further trimmed on the river bank. Hence the actual cores are seen among the gravel spread.

Maharashtra

Godavari Basin (*See Fig. 18*)

Maharashtra consists of two main geographical units, viz. the Desha or the Deccan plateau and the Konkan or the coastal strip. The former is formed by the horizontal sheets of lava which on weathering have resulted in a beautiful topography : hills with terraces and occasional peaks, and fairly wide river valleys. Depending upon their proximity to the monsoon zone, all these are more or less wooded, the eastern parts being comparatively much less forested. However, the whole of the Deccan plateau, barring perhaps the most elevated and densely forested parts, the rest was inhabited by Early Man. The evidence from Nasik, Akola and Nevasa (the latter two in Ahmadanagar District) indicate that the altitude between 2,000—2500 with its rainfall and forests was no barrier, as was once thought by Foote.[93] Man lived on the banks of the first rivers—the Godavari and its tributaries which flowed on an uneven surface, but in a much wider bed. Consequently the hollows are covered with fine clay, over which was deposited a gravel layer, as for instance at Gangapur, near Nasik. But at Akola and Vite, which are similarly situated on the higher reaches of the Pravara, only a few miles below its source, a thick rubble-like gravel is laid over the basal rock.[94] Hence the order of deposits at Gangapur, Akola, and Nevasa seems at first sight different, but is basically the same. (*See Fig. 20*)

Stratigraphy

Thus we have from botton upwards at

Gangapur	Nevasa	Akola
Silt	Fine loose gravel	
Fine gravel	Silt	

89. Joshi, *op. cit.*, pp. 56-60.

90. *Ibid.*, p. 59.

91. *Ibid.*, p. 60.

92. *Ibid.*, p. 52.

93. Foote, R. B., *The Foote Collection of Indian Pre-Historic and Proto-historic Antiquities. Notes on their Ages and Distribution*, (Madras 1916), p. 41.

94. See, Sankalia, H. D., Deo, S. B., Ansari, Z. D., and Ehrhardt, S., *From History to Prehistory at Nevasa* (Poona, 1960), p. 528.

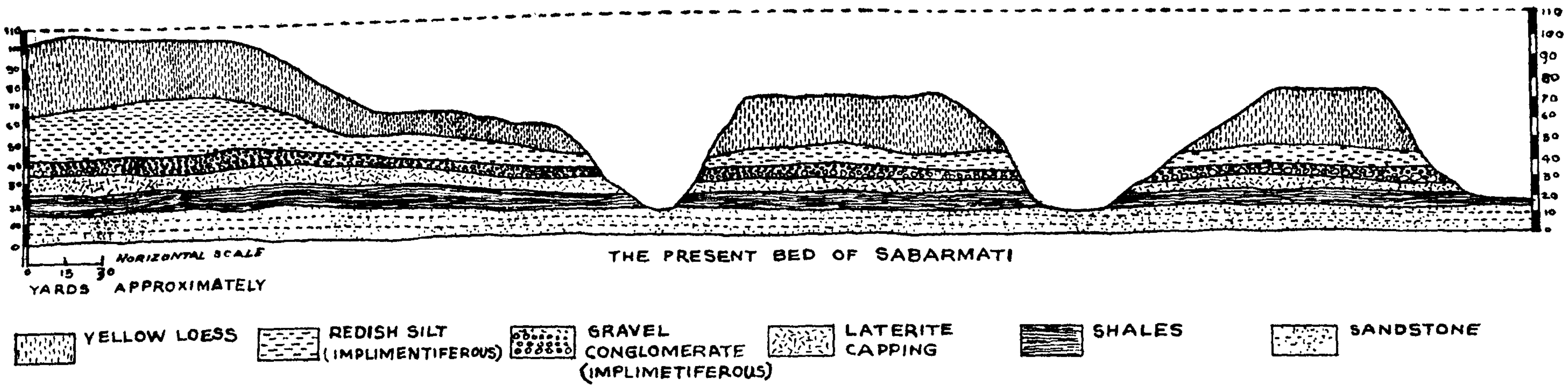


Fig. 22 Section at Pedhamli on the Sabarmati, N. Gujarat

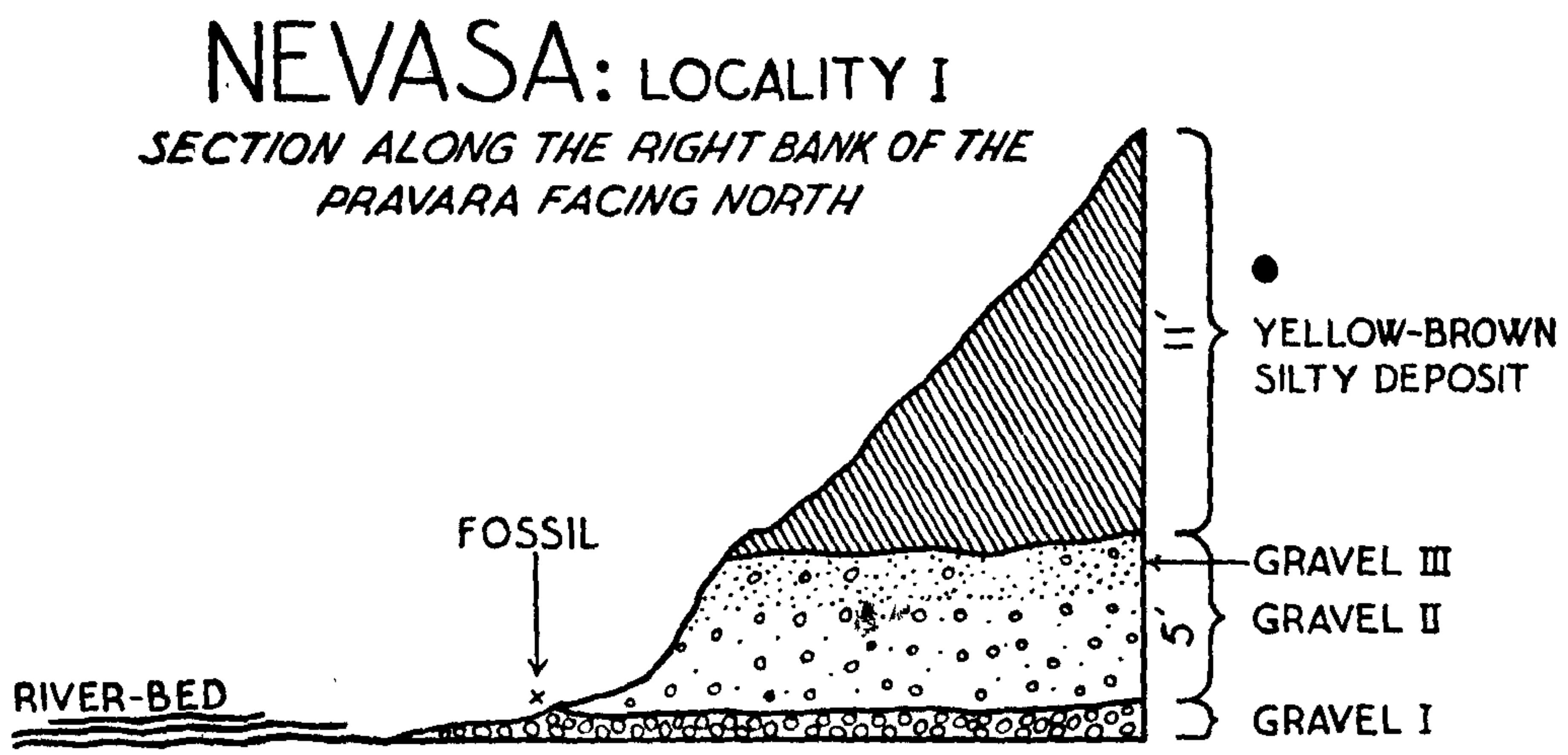


Fig. 20 Section of the Pravara Locality I at Nevasa

Gangapur	Nevasa	Akola
	Gravel	
Yellow silt	Yellowish silt	Silt
Gravel	Cemented gravel	Rubble gravel
Brownish clay	Rock	Rock
Rock		

Tool Types

Since good pebbles are scarce in trap rivers, Early Man in all these regions made implements from chunks or flakes available in the river bed, or quarried them from dolerite dykes which appear in the basaltic formations. Normally the latter method seems to have been preferred, for these dykes supply very fine close-grained material. Tools made on flakes therefore predominate, and even amongst these are all types of cleavers.[95] The latter might suggest a genuine need for these cutting tools, because of the environment, or the influence of raw material. But there are a few (some very fine) hand-axes, scrapers or side-choppers, chooping tools with wavy edge and hammer stones or round balls.[96] The occurrence of the last was rather unusual, because these had not been reported from other collections elsewhere in India. But since then such tools have boen found on the Bina, District Sagar. However, their place in the life of the Stone Age man is most emphatically proved by their occurrence along with hand-axes in a habitation site in Northern Rhodesia, Africa, which was excavated by Dr. DESMOND CLARK.[97] Probably these are the African "bola" stones, many of which have been found in Olduvai, Tanganyika, East Africa. These round stones were cleverly wrapped in raw hide and connected by thongs. A hunter would then hurl this weapon at the legs of the game, entangling them in the strings. This ancient method of hunting is still practised by South American Gauchos and some Eskimos.[98]

Other rivers

In the rivers of other districts, for instance the Mula at Poona,[99] the Bhima at Pandharpur,[100] Sholapur District, the Tapti in the West Khandesh District,[101] and the Wardha in Chanda[101a] solitary discoveries have been made. These confirm the general picture of the life and times obtained from Gangapur and Nevasa. There were at least two climatic cycles, consisting of wet and dry phases. Man appeared on the Deccan rivers during the first wet phase, when the rivers were laying down their load. He made tools—mostly cleavers and comparatively few hand-axes—[102] on dolerite, obtained from dykes. With these he fell trees and probably cut the carcass of animals like the ***Bos namadicus***,

95. SANKALIA, H. D., *The Godavari Palaeolithic Industry*, (Poona, 1952).
96. SANKALIA and others, *From History to Prehistory at Nevasa*, pp. 76-101.
97. *JRAI*,. Vol. 89, pt. ii, p. 208 and Fig. 5, 5.
98. The bola device is beautifully illustrated in *National Geographic*, October, 1961, p. 578.
99. *I.A.R.* 1957-58, p. 67. Only very recently a small chopper, having the edge worked by step-technique from two sides was found at the Bund Garden site.
100. *Ibid.*, 1956-57, p. 78.
101. *Ibid.*, 1958-59, p. 24.
101a. *Ibid.*, 1960–61, p. 22. The most important site is on Papamiya-Tekdi on the Jharpat.
102. In Chanda choppers on pebbles have also been found.

Elephas antiquus and Rhinoceros, the remains of which have been found at Nandur Madhmeshwar, Kalegaon and Nevasa.[103]

Konkan : Bombay Area

In the Konkan, it is the Bombay area around Borivli, Kandivli which has supplied the traces of Early Man. From the nature of the evidence, we may say that this man might have lived at Malabar Hill, Worli Hill, Pali Hill and other hills upto Padan and beyond upto the Bassein' Creek, right along the foot of the hillocks, which one sees as the residence of the rich and elite. For far in the past, the Arabian sea washed the foothills, its level being higher than today. Later the sea level sank, and the coastal strip was formed. Tradition and geology thus seem to receive additional support from archaeology. This is one way of explaining the existence of laterite gravels and clays which cover the slopes of hills. But it is also probable, as our observations made subsequently show, that the ground near the foothills has been laid by the mountain streams under two wet and dry cycles respectively. These are now being eroded. Unfortunately all these gravels have been blasted and carted way during the last 40 years, mostly for filling up the Back Bay. But the few remnants at Worli, Kandivli, Borivli, Malad etc. were observed by Lt. Col. TODD.[104] At Kandivli behind the present Physical Culture School, Borivli and Goregaon he noticed interesting sections. For instance, at Kandivli the section is about 7 to 10 ft. and consists of (from bottom upwards) :

18 in. Red earth
3 ft. Rubble Gravel lateritised
1 to 6 ft. Lower Gravel
3 in. clay
Rock

This small section is described to have yielded tools representing the Lower and Upper Palaeolithic, and microlithic industries. Thus from the Lower Clay and from its junction with Lower Gravel respectively have come " rough tools " and flakes of Clactonian character (that is flakes with prominent bulb), and scrapers, cores and choppers. The gravel itself gave again tools of similar nature and Chellian types, whereas on its top occurred these as well as late Acheulian hand-axes and one of a beaked type.

Thus within 6½ ft. which is the maximum thickness of the lower clay and gravel, industries representing two phases of the Lower Palaeolithic in Europe occur.

Naturally doubts have been expressed by some scholars about the deposit. They think that it might be all one—a re-deposit—though TODD says that many tools are in a mint condition. And this is true, as the writer himself has collected a few tools from the area and handled the hand-axe[105] found by Dr. KALAPASI along with TODD.

103. SANKALIA *et. al. From History to Prehistory at Nevasa*, p. 78.

104. TODD, K. R. U., " Palaeolithic Industries of Bombay ", *JRAI*. Vol. LXIX, (1939), pp. 257-72.

105. The writer understands on reliable authority that this quartzite hand-axe was not found there. Until this information was given to him, it was all along a mystery to him, how a thing made of quartzite could be found at Kandivli, because this raw material is not locally available.

Recently Shri MALIK carried out a little more extended survey of the area. While his examination of the Dahisar stream seems to confirm TODD's stratigraphy, unfortunately he discovered no Early Palaeolithic tools. So he was forced to rely upon former data. So the problem remains unsolved. A fresh, concentrated study is necessary, when attention should also be devoted to the raw material. From where did man get quartzite[105] and flint-like material for his tools? Where is the occurrence of shale and other rocks in the neighbourhood, so that chunks of it got washed out and were buried in the Lower Gravel during the first wet phase ?

Since writing the above, the writer had an opportunity to examine the entire area with two of his pupils, Dr. G. C. MOHAPATRA and Shri V. N. MISRA. Two sections were noticed in the Nala I and Nala 2, immediately behind the Physical Culture School on the Padan Hill. Though there seems to the eye two terraces, one at a slightly higher level than the other, through which the lower Nala flows, the sections appeared to be composed of two main deposits, a cemented lower gravel at the bottom and silt—sand and gravel—a re-wash on the top. Out of nearly 100 pieces, 60 or so comprised cores with deep flake scars, flakes, scrapers, points and borers, and burin-facet nodules, but no genuine hand-axes and cleavers.

The Lower Palaeolithic Industry and a complex section showing three climatic phases corresponding to three distinct geological strata seem to be indeed absent. This impression was also confirmed by Professors ZEUNER and SUBBARAO, who fortunately happened to visit the site at our suggestion. Since the tools resemble so-called Series II or the Middle Stone Age these have been described and illustrated in the relevant section of this book.

GUJARAT

Sabarmati Valley (See Fig. 21)

Following the clues supplied by FOOTE, the Gujarat Expedition of 1941 roamed the valleys of the Sabarmati, the Orsang and Karjan in Norhern and Central Gujarat. The work was continued for short seasons until 1949. In this year the Deccan College Post-graduate and Research Institute in co-operation with the Government of India, invited Professor ZEUNER of the Institute of Archaeology, University of London, to advise them on the environmental conditions of Early Man and his successors in Gujarat and elsewhere by a study of the geological deposits from which man's tools etc. were found. All these studies enable us to have a fairly good picture of the Old Stone Age in Gujarat, though its precise dating is not yet possible.[107]

Climatic Cycles

Early Man had arrived or lived in Gujarat when the climate was comparatively "wet" than today in Northern and Central Gujarat. The rivers Sabarmati, Mahi, Orsang and others had not cut such a deep channel in their bed as at present. On the contrary they flowed in a comparatively

106. MALIK, S. C., *Stone Age Industries of the Bombay and Satara Districts*, (M. S. University Archaeological Series No. 4, Baroda 1959), p. 16 and Fig. III, i-iii.

107. Since writing this Professor ZEUNER once again paid a short visit, during which he noticed evidence on the Mahi, according to which the hand-axe industry in Gujarat may be dated to antipenultimate, that is, the 2nd interglacial period.

broader and higher bed. Owing to heavier rainfall the rivers carried large coarse pebbles. These were deposited in shallow pools containing fine mottled clay.

Gradually the climate became drier when the rivers consequently brought down only sand and silt, which filled up their beds. The Early Man probably witnessed this phenomenon.

When this happened, the Sabarmati river probably shifted westward, and owing to another change in climate, now becoming more wet, forests once again covered the country and a red soil was formed over the silt. Early Man disappeared from the scene. This was followed by a series of dry, and semi-dry phases during which Gujarat was covered by thick deposits of wind-borne alluvial sands.

These huge deposits, including the older beds were then cut by periodic heavy rain, which today characterize the climate of Northern and Central Gujarat. Thus have been formed the peculiar physiographic features of this part of Gujarat, viz. flat sandy plains with small hillocks or sand dunes enclosing inundation lakes, and nearer the rivers huge *kotars* (or gullies) and cliff-like river banks.

The climatic cycles may be briefly enumerated below.[108] Beginning with the present and going back to the past :

Modern (*Z*)	Long dry season with a short wet period	
(*Y*)	Dry phase	Pottery with microliths and Iron
(*X*)	Slightly wet pase (fossil soil)	Microliths and skeletons
(*W*)	Dry phase	Dunes blown over the land surface
(*V*)	Slightly damp	Flat land surface
(*U*)	Mainly dry phase	Second river aggradation with silt and wind-blown sand; later pure aeolian sand
(*T*)	Wet phase	Red soil formed by a damp climate. River bed shifted westward.
(*S*)	Dry phase	River aggradation by silt. Palaeolithic man present.
(*R*)	Wet phase	Cemented gravel. Palaeolithic man first appears.
(*Q*)	Dry phase	Mottled clay in the river bed. First Sabarmati.
(*P*)	Wet phase	Laterite

The main tool bearing deposits are from bottom upwards (*i*) the gravel conglomerate (*R*), (*ii*) junction of gravel and silt (*R–S*) and (*iii*) the lower half of the silt (*S*).

108. ZEUNER, F. E., *Stone Age and Pleistocene Chronology in Gujarat*, (Poona 1950), p. 23.

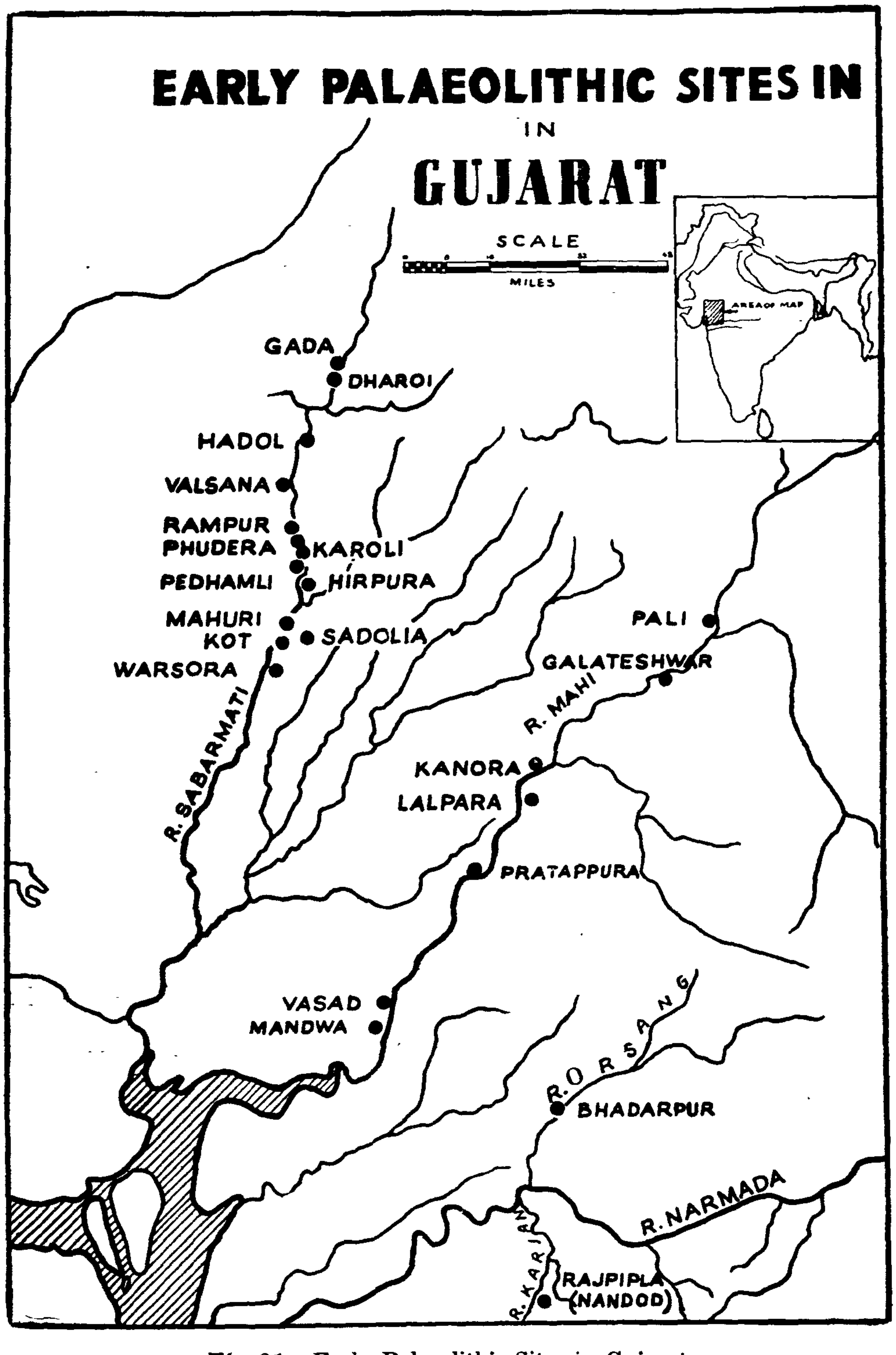


Fig. 21. Early Palaeolithic Sites in Gujarat

Sites on the Sabarmati (See Fig. 21)

The Early Man lived along the banks of these rivers and was a witness to the slow climatic change (though hardly realizing it). His tools were found at several places on the Sabarmati, the southernmost being Warsora and the northernmost being G..da, near Khed Brahma. But the most important are Hirpura, Aglod, Pedhamli, Phudera, Rampur, Hadol, and Valasna. The Kasara Nala at Pedhamli is a veritable factory site. From Valasna and upwards the conglomerate becomes distinctly pebbly; no hand-axes and cleavers have so far been found from these sites, but mostly split pebbles, with occasional marks of work on the edge formed by broken surface. While some of these split pebbles may be regarded as genuine pebble tools, a few suggesting the Sohan influence, the writer who has examined the region for a number of seasons feels that such pebble-tool-like forms abound because as we go upstream nothing but pebbles are found in the bed, and some of them include naturally broken specimens as well. The view therefore first expressed by KRISHNASWAMI[110] and later adopted by others[111] that in Gujarat and southern Rajputana we find the meeting place of the Sohan and the Hand-axe Cultures requires a re-appraisal.

Tool Types

Leaving out such doubtful pebble-tools, the normal assemblage of tools on the Sabarmati consists of huge cores with pebble surfaces, having one or two flakes removed by alternate flaking, hand-axes, cleavers, flakes and small discoidal cores. Unfortunately all these tools, either (*i*) with irregular outline, deep concave flake scars (as a result of free flaking on block-on-block technique) and also rough "step" flake scars, and pebble cortex at the butt end or over part of both the surfaces, or (*ii*) regular outline, fine wavy edge, comparatively smooth 'step' flaking, some probably by soft cylinder hammer technique and no pebble cortex or the cortex patch at a definite place are found in the lowest gravel bed. Thus no stratigraphic evolution in the tool types can be vouchsafed.

Possible Evolution

However, there are three specimens—two hand-axes, one pear-shaped, and other very thin, perfectly symmetrical ovate and one U-shaped cleaver from the upper part of the reddish silt which are so fine—all the three having been made on a flake and then finished off by skimming flake scars—so as to suggest a late typologic evolution corresponding to the uppermost phase of the alluvium.[112]

Typologically these three groups of hand-axes closely resemble (*i*) the Abbevillio-Acheulian, (*ii*) the Middle Acheulian, and (*iii*) the Late Acheulian industries of Madras etc. as well as those of Western Europe.

Mahi and other Valleys

In Central Gujarat, the Valleys of the Mahi,[113] the Orsang and the Karjan[114] (a tributary of the Narbada) have yielded similar results, though none of these

109. SANKALIA, *Investigations*.
110. *A.I.*. No. 3 (1947), p. 32. See also SOUNDARA RAJAN in *A.I.*, No. 17, 1961, p. 73.
111. LAL, B. B. in *A.I.*, No. 12, pp. 86-89. It is realized by both LAL and KRISHNASWAMI that the pebble-tools in the north and the south might belong to two different traditions.
112. For a brief account see SANKALIA, H. D., *The Vedic Age*, Vol. I, p. 127, for details *Investigations*, p. 38.
113. SANKALIA, *Investigations*, p. 48. and SUBBRAO, *Journal of the M. S. University*, Baroda, Vol. I, pp. 34-62.
114. SANKALIA, *Investigations*, p. 319.

rivers is yet fully surveyed. At Bahadarpur on the Orsang the tools are made on quartz and quartzite. Among the former are a fine Acheulian hand-axe and a long flake[115] which is obviously a blade made on Levallois technique. Both—but particularly the blade—suggest a Middle-Upper Palaeolithic element in the Stone Age Cultures of Gujarat.

The Karjan near Rajpipla needs to be freshly surveyed. Not only the various layers indicate a succession of climatic phases, but unlike Northern Gujarat, a huge pebble bed occurs almost at the top, implying a different environment. Even now this region gets much more rain, and the river flows through the trap rock.

The tools so far found are few,[116] but they are all of trap and highly advanced such as elongated hand-axes, cleavers of various shapes, some on Vaal technique, thin fine discoids and pebble tools.

MADHYA PRADESH

Narbada Valley

Further eastward the Upper Narbada Valley has long since been known for its rich fossil Middle Pleistocene fauna. A palaeolithic tool was also found at Bhutra in 1873 in association with fossil mammals. Later the Valley was surveyed by De TERRA and PATERSON[117] in 1935 and a correlation of the stratigraphy, the tools and fossil evidence was attempted.[118]

De Terra's Stratigraphy

The stratigraphy as reconstructed by them is as follows :

Layer	Group	Age
Black Soil, Fine Gravel		Upper Pleistocene and Later (Holocene)
Pink silt, Gravel	Upper Group	Middle Pleistocene
Pink silt, Gravel	Lower Group	Middle Pleistocene
Laterite		
Basal Rock		

Nature of Industry : De Terra

This brief—very brief indeed and most inadequately described and illustrated—study indicated the presence of various types of industries—Early and Late Sohan and the Abbevillio-Acheulian. At some localities there is a mixture of the different types, whereas at one locality near Narsingpur the Late Sohan seems to replace the Acheulian culture. De TERRA would, however, tentatively suggest that the Narbada Lower Group represents the true Acheulian and Early Sohan, and the Upper Group the Late Sohan Industry.

115. Now in the Deccan College Museum. SANKALIA, 1946, p. 48, pl. XI, 13-14.
116. SANKALIA, *Investigations*, p. 317.
117. De TERRA and PATERSON, *op. cit.*, pp. 313-26.
118. De TERRA and PATERSON. *op. cit.*, p. 316 and p. 319.

Views : Later Workers

These very far reaching conclusions have not been corroborated by subsequent observers. McCown and Banerji examined the sections in 1958 and Khatri in 1959.[119] The writer and Subbarao have studied in some detail the sections at Maheshwar,[120] about 100 miles down stream from Hoshangabad.

It appears first from McCown's observations that nowhere do we get a clear stratigraphical picture as postulated by De Terra. These seem to be "reconstructions." Even the laterite which starts the entire series was not noticed by all the observers. No doubt, they have discovered the tools and fossils in the gravels, but never in the pink silt. More important is the fact that it is difficult to decide which is the "Lower Group" of gravels and which the "Upper" without a prolonged longitudinal survey of the valley.

Stratigraphy at Maheshwar

At Maheshwar on the contrary the stratigraphy is much more clear. Though no laterite exists and though no bed has so far yielded any fossil, the superposition of the two groups is there. The lower gravel is very often eroded. Wherever it is preserved, it is seen as a comparatively thin, highly cemented bed. Three of such exposures are :

(*i*) down stream of Maheshwar, near the Ganesh nala from which an early semi-rolled Abbevillian hand-axe was extracted ;

(*ii*) in the nala behind the Maheshwari river, about a mile upstream from Maheshwar ;

(*iii*) on the opposite bank, near the Kasrod nala.

The second group resting on the lower pinkish clay is usually very well preserved. It can be seen down stream on the Maheshwar side, particularly in the Sahasradhara nala, and secondly in the Maheshwari nala where it caps the lower groups, and on the opposite bank for nearly two to three furlongs near the Kasrod nala. This nala which almost runs parallel to the Narbada has in its high cliff-like, vertical, sides, the finest exposures of the second gravel. In its constitution, it does not materially seem to differ from the first ; only it is not so well cemented as the latter. In future, if any detailed investigations are to be conducted, this nala should receive a high priority.

Climatic Sequence (See Fig. 37)

Our studies further revealed the fact that the second gravel is capped by nearly 60 ft. of yellowish silt, the entire formation being nearly 80 ft. from the water level and constitutes the topmost terrace (T1). This was later extensively eroded during a wet phase. Later the hollows or depressions so caused were filled up by another aggradation in the subsequent dry phase. This deposit of comparatively fine gravel with trap, chalcedony, jasper as its prominent constituents and capped by a brownish silt forms another terrace (T2) at a height of about 60 ft. from the water level. The gravel is fairly well cemented. Its best

119. Very tentative inferences are given in *I.A.R.*, 1958-59, p. 27 and 1959-60, p. 22, Khatri mentions some 40 pebble tools on block-on-block technique from the gravel layer at Piparia and thinks that these represent the earliest lithic industry on the Narmada. Some by Sen are reported in *I.A.R.*, 1960–61, pp. 59-60.

120. *I.A.R.*, 1958-59, p. 30.

exposures are near the Kasrod nala and downstream from Maheshwar. In its turn, the fringes of terrace 2 are covered by a very loose kankary gravel and silt during the latest aggradation. Thus at Maheshwar the following climatic sequence can be inferred from the river deposits :

8 or 7	Wet phase	Black soil
7 or 8	Temporary Flood Deposit[121]	Kankary sandy gravel and silt (Loose resting on 4)
6	Dry phase	Brownish silt
5	Wet phase	Smaller trap gravel (III)
4	Dry phase	Pink silt
3	Wet phase	Pebbly gravel, not so well cemented as 1. (II)
2	Dry phase	Pinkish silt
1	Wet phase	Cemented pebbly gravel (I)
		Rock.

Tools

Tools present a problem. For very few tools were found *in situ* from the gravel layer, nos. 1 and 3. No tools were found at Hoshangabad from the pinkish layers 2 and 4. But if the *in situ* tools are any guide, it may be said that already by the earlier gravel phase man manufactured tools from huge cores by alternate flaking on block-on-block or stone hammer technique. This has left behind a number of excellent cores and a still greater number of big flakes with a high angle and no platform. Some of these flakes are turned into " scrapers " or choppers having one side suitable for a hand-hold. One does not know what De Terra means by pre-Sohan flakes from the Narmada, for none of these is illustrated. But the writer feels that De Terra had such large, high angled flakes in mind.[121a].

Associated with these flakes are a few hand-axes. Those extracted from the lowest gravel are of the Abbevillian type with large concave flake scars and cortex. However, the collection does include ovates and other finer hand-axes of Acheulian type, but so far Maheshwar has yielded a large number of flakes, cores, cleavers and a few hand-axes.

The number of cleavers is on the whole larger. This is understandable, because it was more convenient to convert flakes into cleavers. These include several types.

So far, however, no tools have been found in these gravels which resemble the Late Sohan which comprises a large percentage of Levallois flakes. Such material occurs in gravel III and the overlying silt and is found in abundance on the surface.

McCown and Banerjee, however, did find a few Levallois flakes of quartzite in what they call "second gravel."[122] It is, therefore, possible that

121. This may rest against the black soil or cover it, and its nature and cause of formation has been confirmed by this year's (September 1961) phenomenal floods.

121a. One of these is illustrated here. See Fig. 5, 2, p. 11.

122. This is also the observation of Khatri, See *I.A.R.* 1959-60, p. 22.

in the Narbada valley man had come upon this technique in the late Middle Pleistocene times. What is therefore needed is to search the two gravel deposits more carefully.

In summary, then, it may be said that during the Middle Pleistocene period (as determined by rather profuse fossil fauna) in the Narbada valley, as elsewhere, the hand-axe culture flourished, and the elements like pre-Sohan tradition were but a part of the same hand-axe culture, not a distinct culture.

Contemporary Fauna

Besides, gastrapods and clams, the forests teemed with wild elephant (*Elephas namadicus* Falc.), wild horse (*Equus namadicus* Falc.), wild ox (*Bos namadicus* Falc.), *Hippopotamus palaeindicus* F. and C., *Stegodon insignis* F. and C., *Rhinoceros unicornis* Lim., *Sus sp.*, *Trionyx sp.*, *Stegodon ganesa* F. and C. *Emys sp.*, *Ursus namadicus* F. and C., *Leptobos frazeri* Rut, *Cervus duvancelli.*

Thus some 13 extinct species of mammals were man's contemporary. So far only three, the elephant, rhinoceros and ox have been found on the Godavari.

MALWA

North of the Narmada and east of Gujarat are Malwa and Rajputana where little prehistoric work was done hitherto. There was only a stray notice of a tool from Bundi in Rajputana and none at all from Malwa. But there was no reason that palaeoliths should not be found in these regions.

Geographically south-eastern Rajputana is not much different from Northern Gujarat. Eastwards it abuts on the Malwa plateau. This though largely formed by the basaltic lava has earlier geological formations as well, which all go to make up the peculiar physiographic features of this region. Western Rajputana is mostly a desert and the river beds are completely filled with sand, which hide all earlier deposits, if any. In North-eastern Rajputana, however, the climate is a little less dry than in the west, and it is also geographically different, so that earlier deposits are exposed.

So when students trained in prehistoric research began to explore the region a number of palaeolithic and other sites on several rivers have been brought to light.

Chambal Basin (See Fig. 23)

In Malwa the river Chambal and its tributaries, particularly the Sivna has been carefully surveyed by Dr. A. P. KHATRI and the results are ready for publication.[123] The most important sites are the two localities, Ramghat and Smashan Ghat at Mandsaur and Nahargadh on the Sivna. The stratigraphy is comparatively simple.

1. Basal trap rock
2. Cemented pebble gravel
3. Yellowish silt
4. Fine well-cemented gravel.

123. KHATRI, A. P., *Stone Age Cultures of Malwa*, Ph.D. thesis in Archaeology, University of Poona and the Deccan College Library, 1958.

MAP OF MALWA
SHOWING
PREHISTORIC SITES

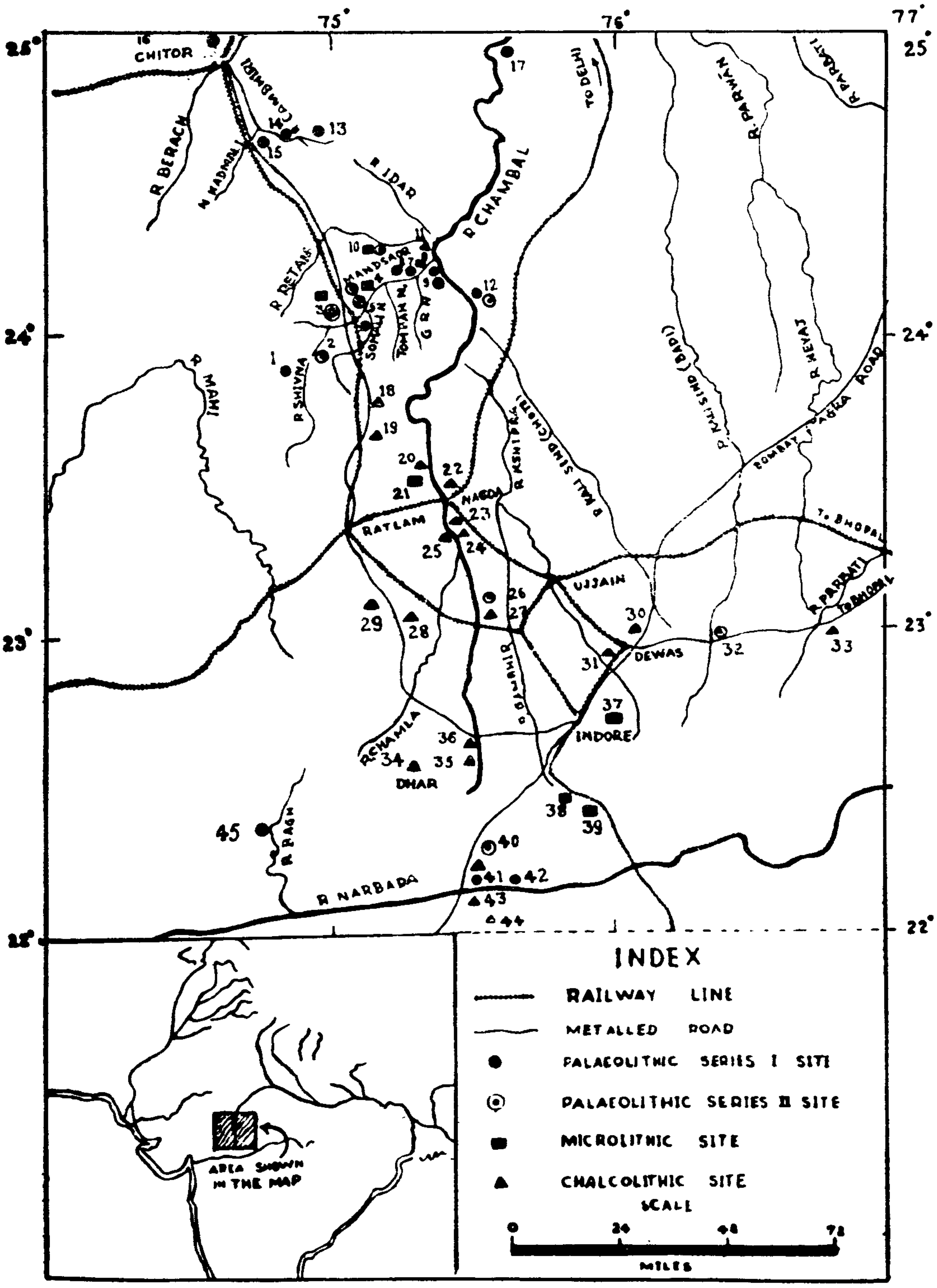


Fig. 23.

The section at Nahargadh is complicated, but this is due to local causes only; essentially it is not different from the one at Mandsaur.

Tools

The cemented gravel has yielded very large flakes with prominent bulbs of trap as well as Abbevillio-Acheulian hand-axes. Other collections include a large percentage of hand-axes (144), cleavers (90), scrapers (10), cores with w-shaped jagged edge (34), flakes (93) but no pebble tools. A majority of tools are made on haematite quartizite, which is not available in the river bed as river pebbles, but which has to be imported from some distance.

The tools may be grouped into three stages typologically, stage III being the evolved Acheulian showing cylinder hammer technique. The absence of pebble tools is understandable, but the large flakes of trap with prominent bulbs lying right on the rock *in situ* prove the existence of the early Clactonian technique and recall similar flakes on the Narmada.

RAJPUTANA

Banas and Gambhiri Valleys

The nature of the stratigraphy and tools is not much different in the Berach, Gambhiri, the Banas and other tributaries of the Chambal, and in the Chambal itself which starting from Malwa plateau flows north-westwards into the Jamuna. Large collections have been made from the Gambhiri near Chitorgarh[124] and Nimbahera,[125], from Tajpura[126] on the Ruparel, from Nagari[127] on the Berach, from the Wagan,[127a] from Sonita[128] and Bhainsrorgarh[129] and a number of sites[130] on the Chambal. Stratified deposits exist at only some four places. And it is also claimed by RAO that there are terraces near Chulia falls, and at Sonita on the Chambal. But unless detailed studies of these large and varied collections are published,[131] no proper idea can be had of the stratigraphy or the industries. RAO's further contention that pebble tools show Sohan influence hence also remains unproved. The few details about stratigraphy and the examination of tool types does not show any striking departure from what one finds in Northern Gujarat or Malwa.

The same is the story on the Banas 120 miles of which has been surveyed by DR. V. N. MISRA.[132] Of some ten sites, the site near Hamirgarh, District Bhilwara, offers a good section viz. 6 ft. of gravel capped by nearly 15 ft. of

124. *I.A.R.*, 1954-55, p. 58. In 1962 this site was carefully surveyed by the writer and large collections of all types of tools made. They show the same mixture of crude and fine tools.

125. *Ibid.*

126. *Ibid.*

127. *Ibid.*, 1955-56, p. 68.

127*a*. The writer and his colleagues discovered a very rich stratified site on the Wagen, about 8 miles south-west of Chitor.

128. *I.A.R.*, 1956-57, p. 5.

129. *Ibid.*

130. *Ibid.*, 1958-59, p. 27 and p. 72.

131. For the Berach and Gambhiri see KHATRI, A. P., "The Stone Age Tools of the Gambhiri Basin," *JUB.*, (1958).

132. *I.A.R.*, 1958-59, p. 42., and MISRA, V. N., *The Stone Age Cultures of Rajputana*, Ph.D. thesis in Archeology, University of Poona and Deccan College, Library, 1961.

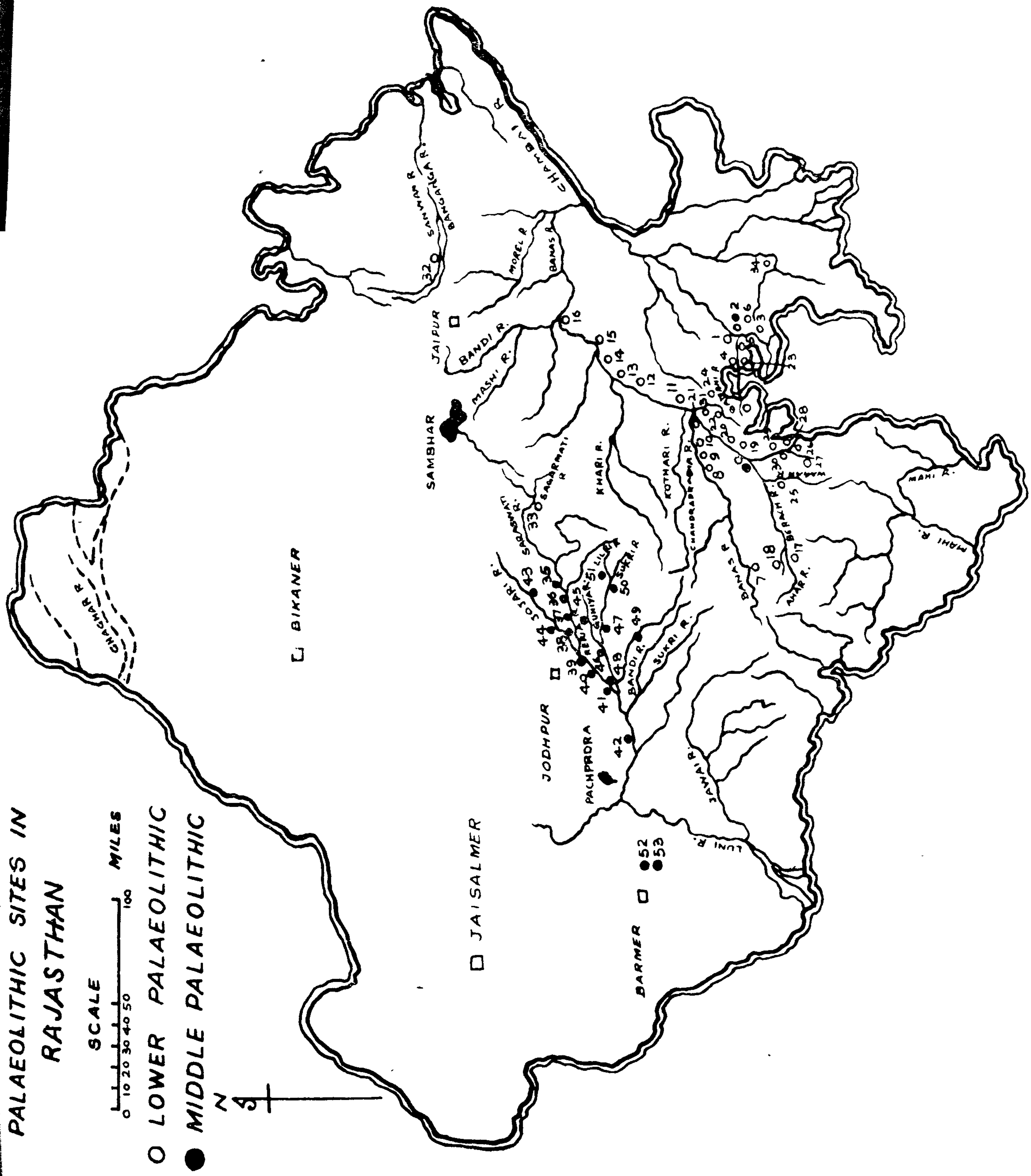


Fig. 24. Palaeolithic Sites in Rajasthan.

silt.[133] The tools comprise hand-axes, cleavers, choppers, large Clactonian flakes and huge pebble cores.

Luni Valley (*See Fig. 24*)

Westwards, however, the picture seems to be different. A careful search of the Luni[134] by MISRA in Marwar has revealed very few early palaeolithic sites. This is, as pointed out before, due to particular environment—dry desert conditions and want of raw material. The few hand-axes that occur are small and seem to belong to a different culture complex, which will be discussed in the next chapter.

N.E. Rajputana

In north-eastern Rajasthan, the hand-axe culture appears once again. At Bhangarh, (District Alwar, north-east of Jaipur), on the Sanvan, another affluent of Chambal, a stratified deposit consisting of two gravel beds intercalated by silt and capped again by silt have yielded pebble tools, hand-axes and Levallois type flakes.[135]

Recently a few palaeoliths were reported from Barha, near Gwalior[136] and the ridge near Delhi, while further northwards they occur in the Second Interglacial deposits on the Sohan in the Panjab and later again with developed Acheulian forms in a terrace of the Third Glacial at Chauntra.

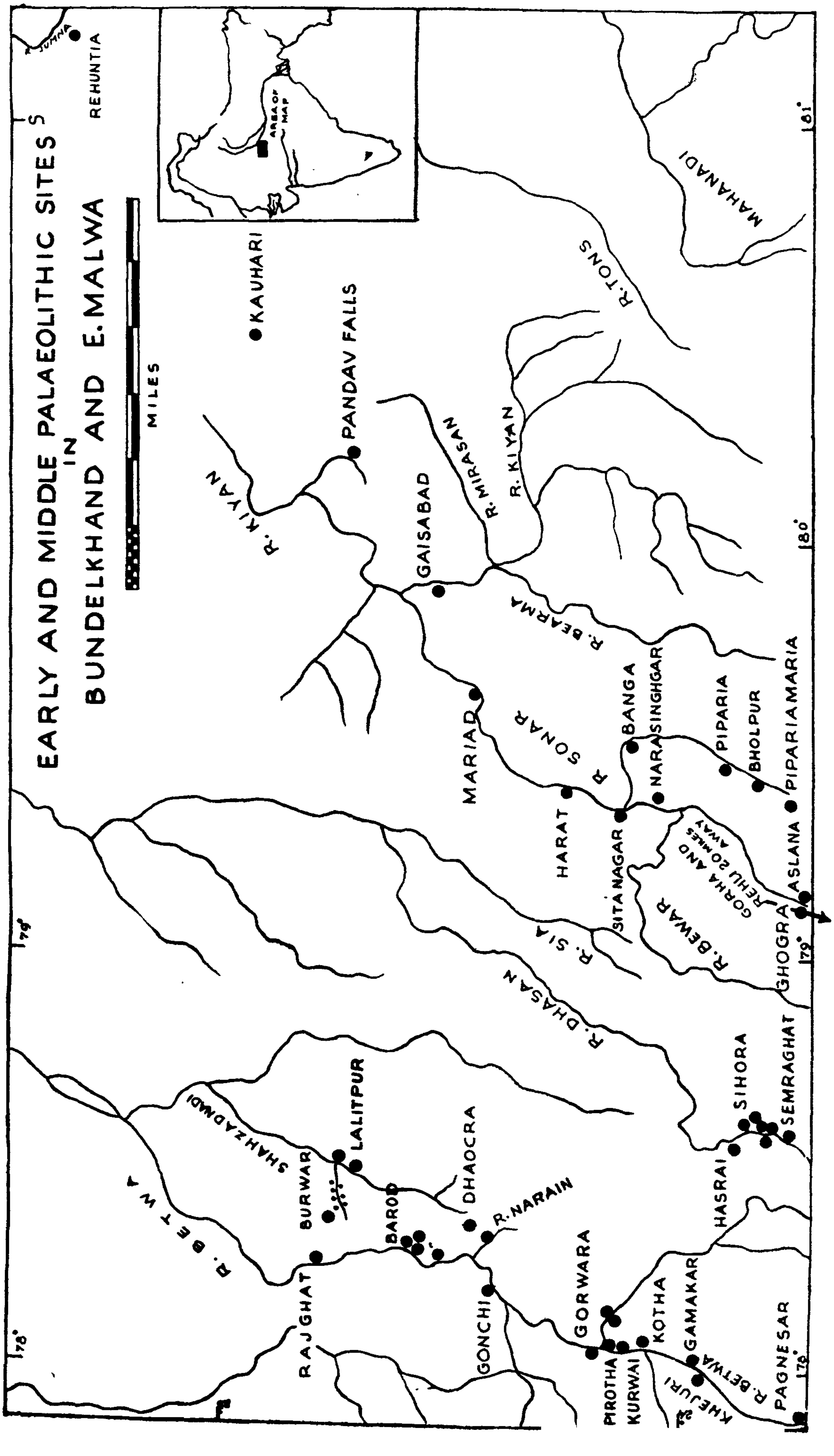
Thus a continuous chain of sites from the north to south on the west and on the east of India have given a glimpse of the hand-axe culture. It was not absent from the heart of India as well. In very recent explorations in the rivers (*See Fig. 25*) of Central India, viz. the Bina and Betwa in the Districts of Bhilsa, Saugar,[137] Lalitpur and in the Banda District near Allahabad,[138] around Nagpur,[139] Jabalpur[140] and further south in the Tapti Valley in West Khandesh,[141] palaeoliths are being found in large numbers.

Of these no details can be given at present, as the reports are not published. But a feature of tools from Lalitpur collected by Shri SINGH of the Deccan College may be mentioned.[141a] Though the material is very coarse sandstone, still the various types of hand-axes and cleavers—majority on flakes—are very symmetrically made.

Illustrated Tool Types (*See Figs. 26-32*)

Since almost the same types of tools appear in the hand-axe area, only important types—some most common and a few rare—are here illustrated from the collections in the Deccan College.

133. *Ibid.*, p. 45.
134. *Ibid.*, p. 42.
135. *I.A.R.*, 1955-56, p. 68 and SOUNDARA RAJAN, *A.I.*, No. 14 (1958), p. 86.
136. *Ibid.*, p. 72.
137. *Ibid.*, 1958-59, p. 26 and p. 27, and 1959-60, p. 70.
138. *Ibid.*, 1954,55, p. 4.
139. *Ibid.*, 1958-59, pp. 18 and 68 and 1959-60, p. 21.
140. *Ibid.*, 1958-59, p. 27.
141. *Ibid.*, 1958-59, p. 24; 1960-61. p.
141a. After writing this, the writer examined the site at Lalitpur. It is a veritable factory site.



EARLY AND MIDDLE PALAEOLITHIC SITES IN BUNDELKHAND AND E. MALWA
MILES
AREA OF MAP
R. JUMNA
REHUNTIA
KAUHARI
PANDAV FALLS
R. KIYAN
GAISABAD
R. MIRASAN
R. KIYAN
R. TONS
MAHANADI
R. BEARMA
MARIAD
R. SONAR
BANGA
NARASINGHGAR
PIPARIA
BHOLPUR
PIPARIAMARIA
HARAT
SITANAGAR
GORHA AND REHLI 20 MILES AWAY
ASLANA
R. BEWAR
GHOGRA
R. SIA
R. DHASAN
SIHORA
SEMRAGHAT
HASRAI
SHAHZADNADI
LALITPUR
BURWAR
DHAOCRA
BAROD
R. NARAIN
R. BETWA
RAJGHAT
GONCHI
GORWARA
KOTHA
GAMAKAR
PIROTHA
KURWAI
KHEJURI
R. BETWA
PAGNESAR
78°
79°
79°
180°
181°
176°

Fig. 25.

Fig. 26

1-3 Pear-shaped hand-axe with a broad, pebble butt. Deep flake scars removed by stone hammer. From the Karjan river, Rajpipla, dolerite, 13.9 cm. ×. 9.2 cm. × 6.7. cm.

4-5 Rostrocarinate type hand-axe, having a large flake removed from the underside, the upper shows an uneven keel, with cortex near the butt, the point is beak-like. Stone hammer technique. From the Pravara river, Nevasa, dolerite, 15.2 cm. ×7.1 cm. × 7.5. cm.

6-8 Triangular type of hand-axe, fully flaked by stone hammer, and possibly also by a soft hammer technique. Tip of point broken, wavy edge. From the Karjan, Rajpipla, dolerite, 12.7 cm. ×. 6.7 cm. × 4.2 cm.

9-10 Discoid, possibly used as a scraper; flaked all round by stone hammer technique leaving a patch of cortex in the centre. From the Malaprabha, Khyad, quartzite, 7.6 cm. × 8.1 c.m. × 3.2 cm. cf. Mousterian core.

Fig. 27

1-3 Large, double-pointed hand-axe, almost fully flaked, leaving small patches of cortex in the centre on one surface and at the butt. Rather a rare form and may be called a pick as well. From the Malaprabha, Khyad, dark-grey quartzite, 25.6 cm. × 8.9 cm. × 6.9 cm.

4-6 Side chopper or a hammer with a convex, projecting broad point, the surfaces and butt having cortex, but intentionally flaked at the side for a suitable hand hold. A unique specimen. From the Pravara, Nevasa, dolerite, 13·8 cm. × 8.8 × 6.8 cm.

7-8-9 Side scraper or chopper, flat flake under surface but surface fully flaked so also the side to facilitate hafting. From the Pravara, Nevasa, dolerite.

Fig. 28

1-3 Elongated pear-shaped hand-axe with a pebble butt. Shallow flake scars giving a smooth surface and symmetrical outline suggest improved technique like the soft hammer. Note the reduction in the thickness (side view). This may be intentional, but also depends upon the original size of the material—pebble or flake. From the Malaprabha, Khyad, light grey quartzite, 18.3 cm. × 9.4 cm. × 5.1 cm.

4-6 Large almond-shaped hand-axe. Beautifully flaked by stone hammer and soft hammer technique resulting in a very symmetrical form. A few flat patches of cortex perhaps intentionally left. Biconvex section. From the Malaprabha, Khyad, fine red jaspery quartzite, 16.8 cm. × 11.4 cm. × 4.7 cm. Originally a fine cleaver in the same material was found at this site, but later lost in transit.

7-9 Small, pointed, ovate. Minutely worked all over on both faces by soft hammer technique. Section biconvex to lentincular. From the Sabarmati, Pedhamli, Fine grained, banded, brownish quartzite, 10 cm. × 8·6 cm. × 3·4 cm.

Fig. 29

No typological evolution in cleavers has been demonstrated in any of tha Deccan College Collections—which are fairly large—either from Karnatak, Maharashtra, Gujarat or Central India. They are all on flakes, and depending upon their nature—thickness etc., the section is parallelogrammatic or otherwise. Rough approximation of the former may be seen in Fig. 29, nos. 3-4 and 7-8 and Fig., 30 3-4. Hence cleavers with different types of cutting edges and/or butt only are here illustrated.

1-2 Cleaver with broad convex cutting edge and narrow tapering butt. Longitudinal sides trimmed from both surfaces. Cutting edge possibly retouched and shows signs of use. From the Malaprabha, Khyad, fine grained chocolate coloured quartzite, 16.6 cm. × 14.4 cm. × 3.4 cm.

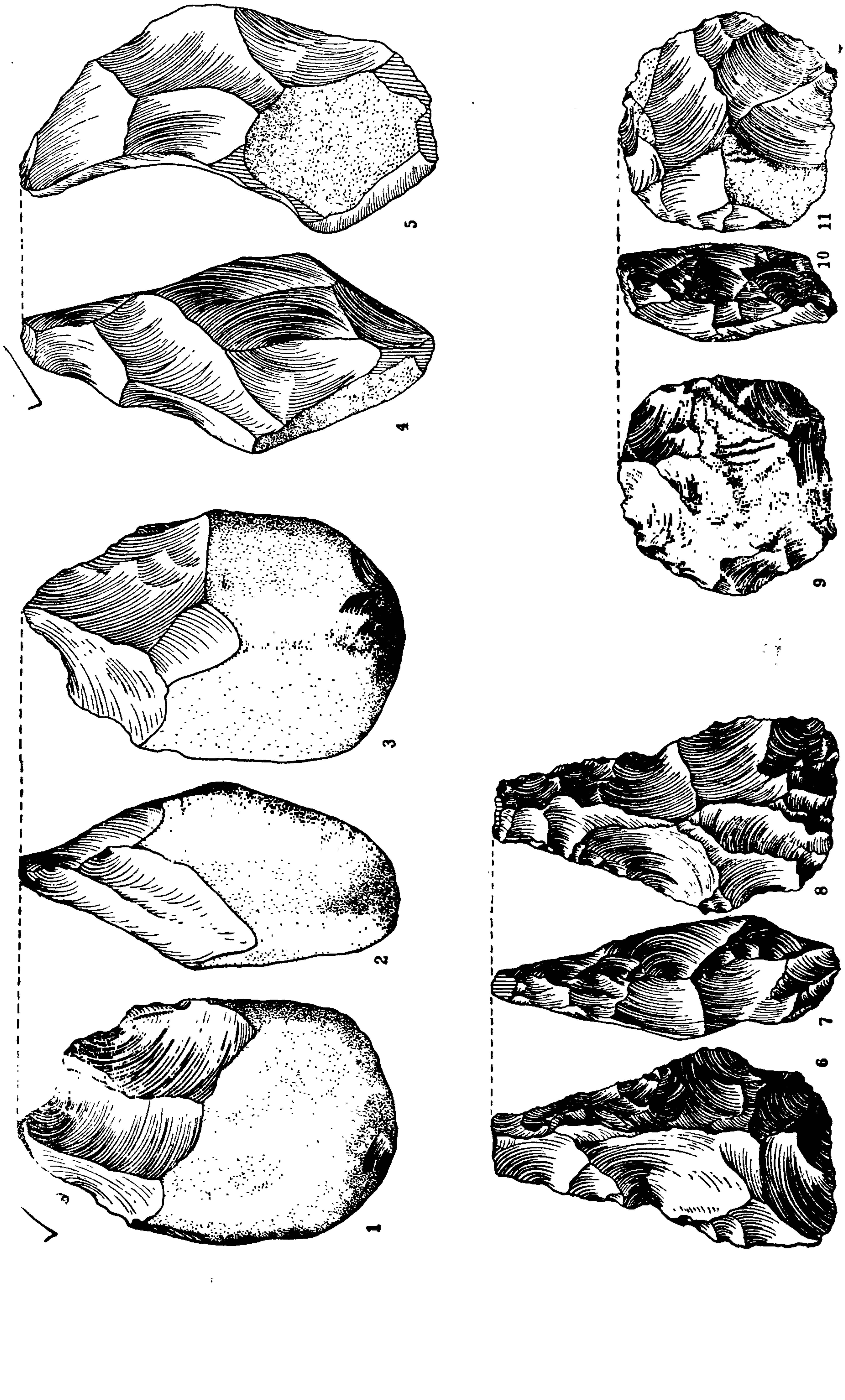


Fig. 26. Pebble-butted hand axe (1-3); Rostrocarinate-like tool (4-5); Abbevillian handaxe (6-8); Discoid Scraper (9-11) (½).

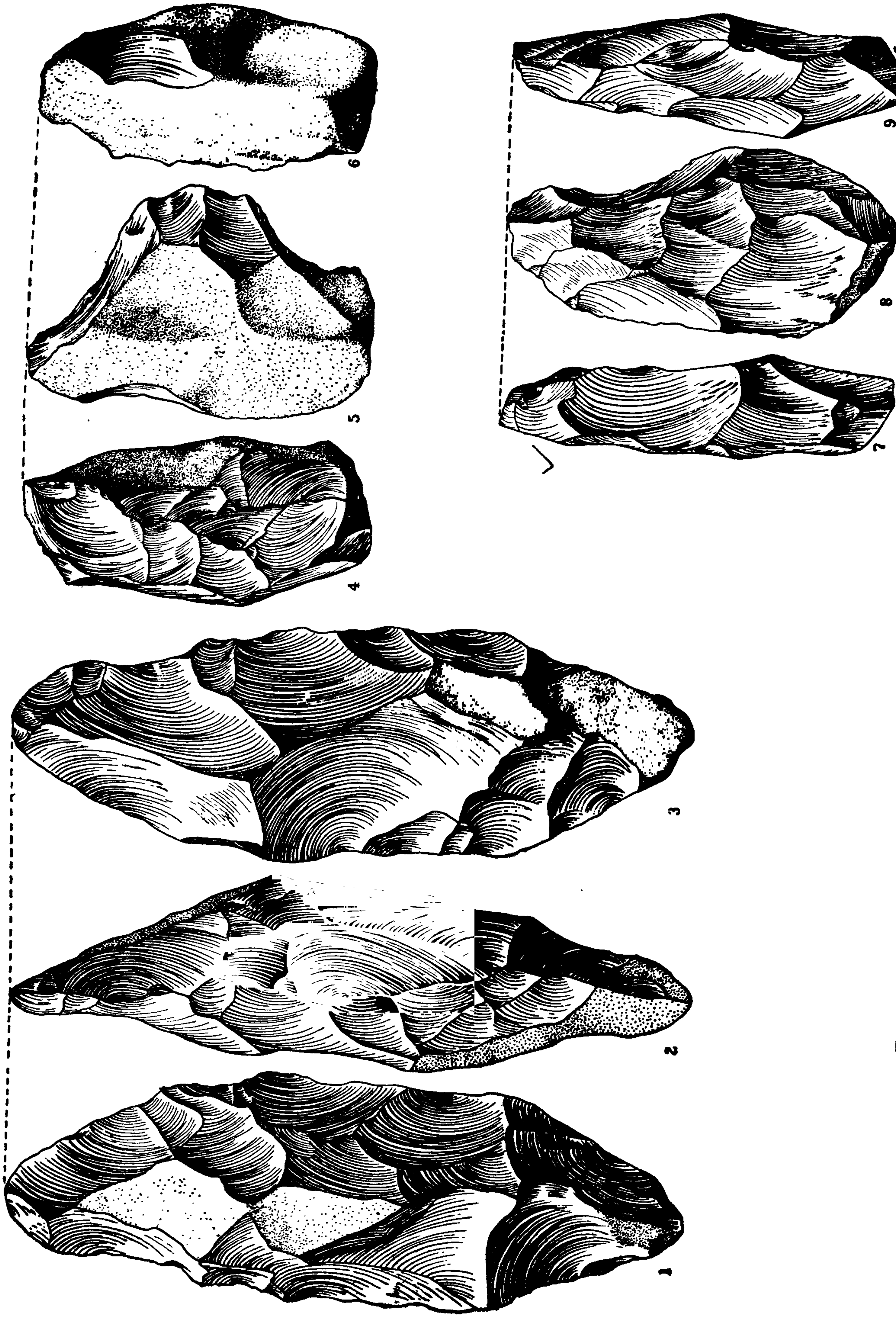


Fig. 27. Double-pointed handaxe (1-3); Hammer-*cum*-Chopper (4-6); Side-Scraper (7-9) ½.

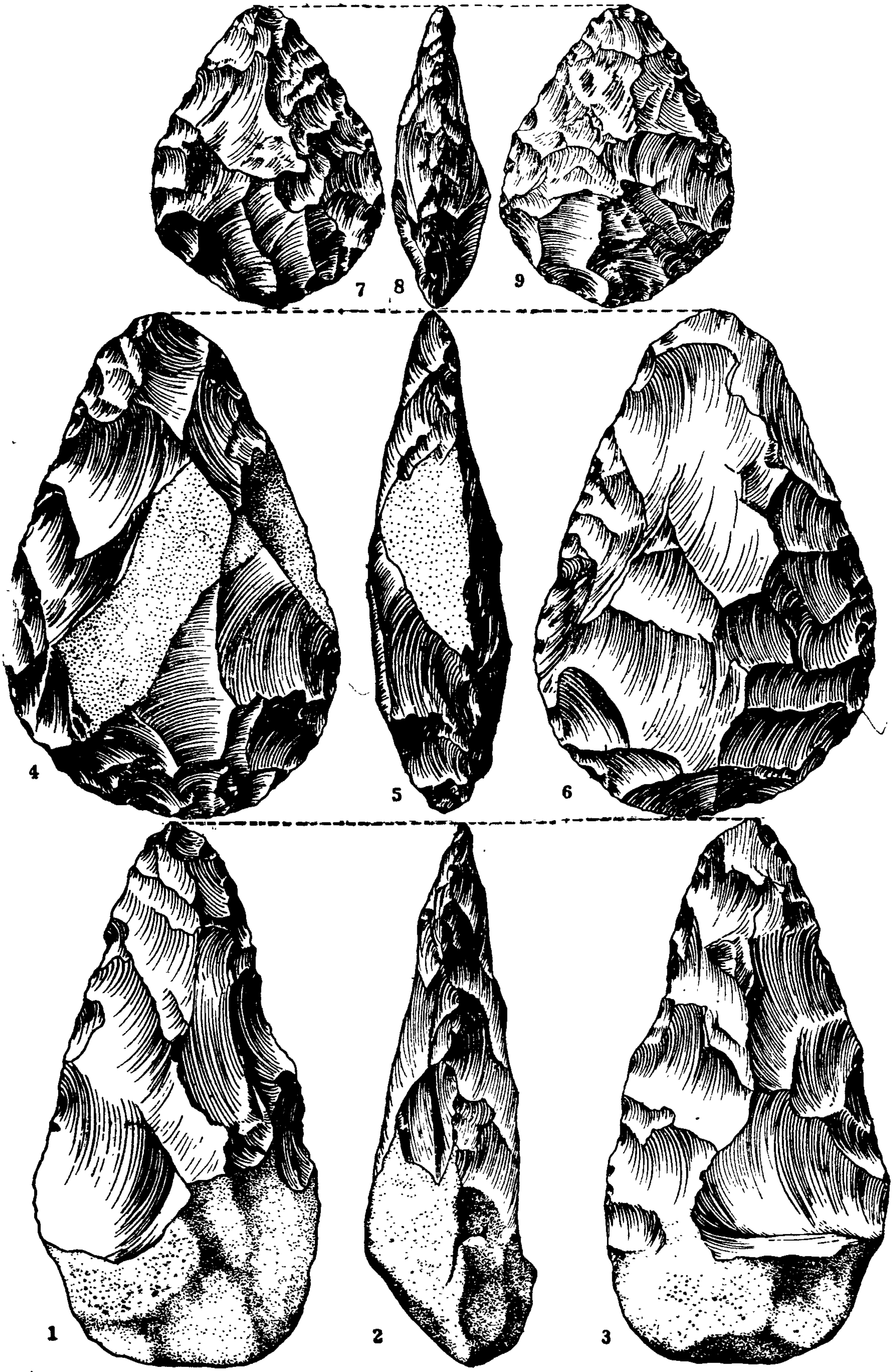


Fig. 28. Acheulian handaxes: Pear-shaped (1-3); Ovate (4-6): Cordate (7-9) (½).

3-4 Cleaver with a slightly convex, flaring edge and pointed butt, made on a side flake; the cutting edge possibly retouched, as well as one portion of the underside, and most of the upper surface; section parallelogrammatic. From the Malaprabha, Khyad, brownish quartzite, 13 cm. × 10 cm. × 3 cm.

5-6 Large oblique-edged cleaver with a broad u-shaped butt, retaining some part of cortex. Both the thick longitudinal sides are flaked. From the Pravara, Nevasa, dolerite, 13 cm. × 9 cm. × 4.5 cm.

7-8 Large straight-edged cleaver with a pointed butt and made on a side flake, which seems to have been removed as in Vaal technique; upper surface fully flaked, section parallelogrammatic. From the Pravara, Nevasa, dolerite, 15.2 cm. × 8.5 cm. × 4 cm.

9-10 Large cleaver with straight edge and broad u-shaped butt on an end flake. The two longitudinal sides as well as the edges have been retouched. Portion of the underside step flaked. Butt end retains patches of cortex, whitish quartzite (now slightly) patinated, 14.2 cm. × 11.5 cm. × 6 cm.

Fig. 30

1-2 Large cleaver with flaring sides and cutting edge having a concavity, on a very thick end flake. From the buried channel of the Godavari near Gangapur, Nasik, dolerite, rolled with smooth, glossy, pecked surface, 14 cm. × 15 cm. × 4.8 cm.

3-4 Cleaver with (an intentionaly made) concave edge with slightly flaring sides and a symmetrical but narrow u-shaped butt, which has been flaked on both surfaces so that a continuous wavy edge runs all round the tool. From the Malaprabha, Khyad, reddish banded quartzite, 13.5 cm., × 9 cm. × 5 cm.

5-6 Small cleaver, with straight cutting edge, and broad u-shaped butt, on an end flake the longitudinal sides and the butt slightly trimmed. Locality etc. as in 1-2, 8 cm. × 7.3 cm. × 4 cm.

Fig. 31 and Pl. II
(Halftone, at the end)

1 Pyriform or fish-like hand-axe, roughly biconvex, fully flaked on both sides by fine ' step ' technique and subsequent retouch along the edge, leaving the central, flat, tabular patch of original cortex on either side; one surface or side quite fresh, as if in mint condition, and a half of the other which was exposed, weathered and with effaced flake-scars. *In situ* at the junction of Gravel II and upper reddish silt. Nevasa, dolerite. 21·3 cm. × 10·3 cm. × 4·2 cm.

Fig. 32 and Pl. III
(Halftone, at the end)

1-2 Hand-axe, elongated, pear-shaped with a heavy butt, having a median ridge on either side, so that the section is parallelogrammatic. Nevasa, Locality VI, surface, dolerite, 17·4 cm. × 10·0 cm. × 5·0 cm.

3 A miniature variety of the above type, but very symmetrical, having very sharp edges, and roughly parallelogrammatic section. Nevasa, Locality VI, surface, dolerite, 12·1 cm. × 5·4 cm. × 3·7 cm.

4 Small hand-axe, *pipal* leaf or heart-shaped. Flaked only along the margin on the upper side. Section biconvex. Nevasa, Locality VI, surface, dolerite, 10·8 cm. × 7·5 cm. × 4·3 cm.

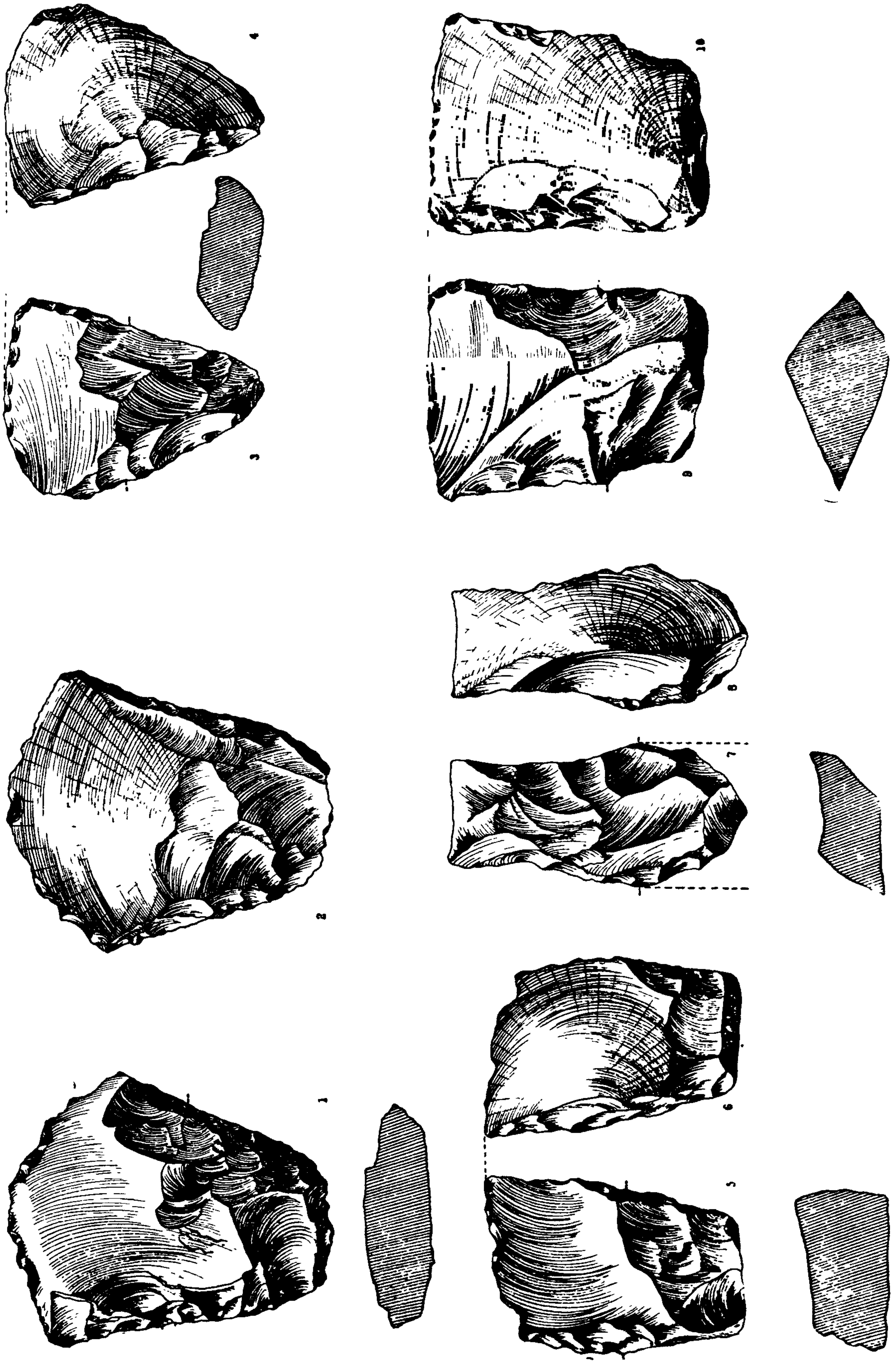


Fig. 29. Cleavers of various types: Convex-edged with tapering butt (1-4); Oblique or straight-edged with square or U-shaped butt (5-6); (9-10); Straight-edged with pointed butt (7-8) (½).

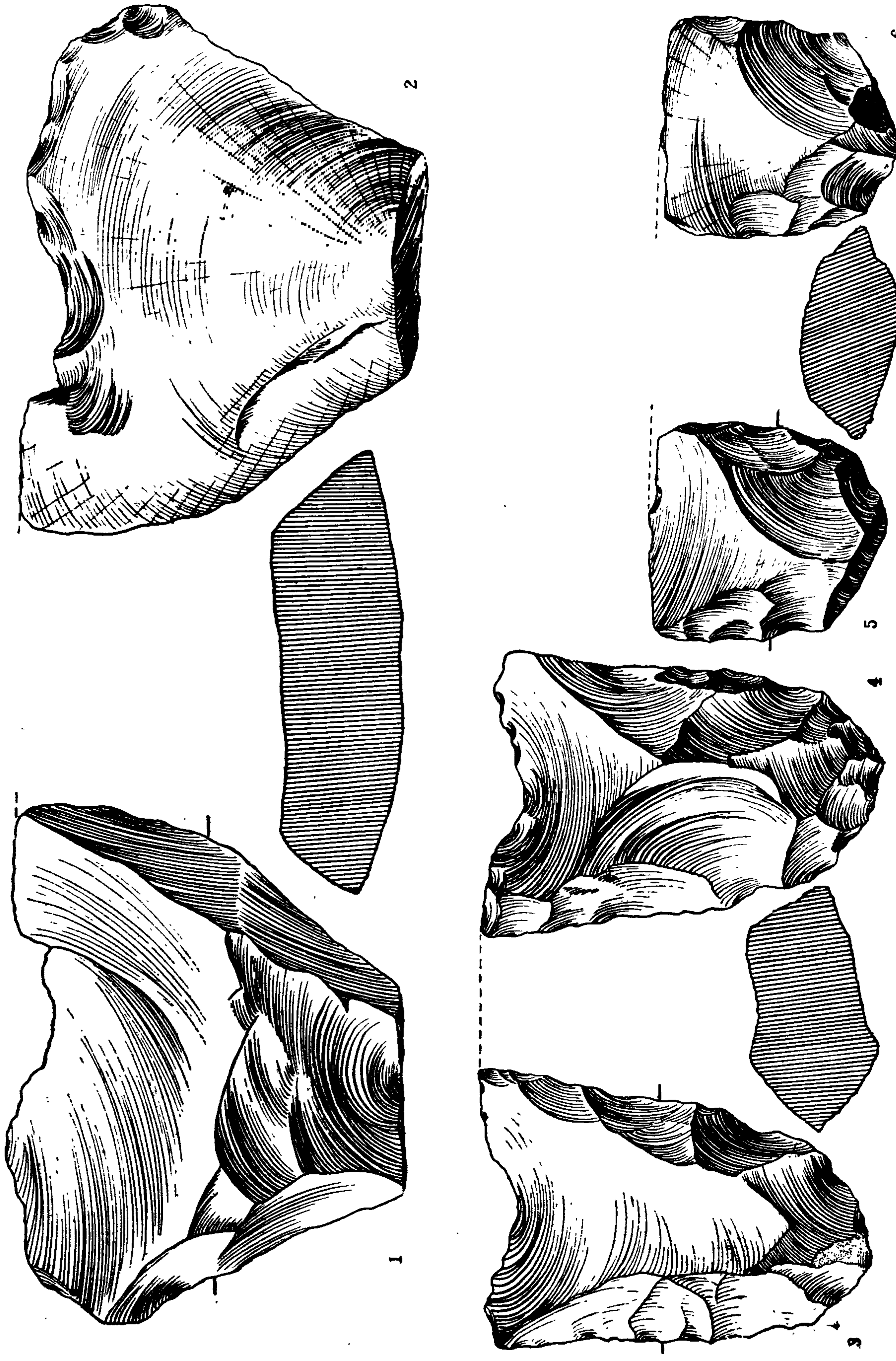


Fig. 30. Cleavers: Concave-edged with tapering or pointed butt (1-4); Straight-edged with U-shaped butt (5-6) (1/3).

Distribution of Lower Palaeolithic Culture (See Fig. 33)

The Palaeolithic map of India is thus being rapidly filled up during the last twenty years. Barring Sind, Saurashtra and Kerala in the west, the district of Tinnevelly in the extreme south, and Assam, Nepal and Kashmir proper on the east, and north-east, the Early or Old Stone Age man seems to have roamed all over India and its frontiers including Burma.

Ecological Approach

However, the question now is, can we at this stage of our studies, make a more precise approach to his habitat and method of living, based on geographic, climatic and ecological considerations as is being now attempted in Western Europe and Africa ?

ZEUNER[142] thought that the hand-axe was an excellent tool for digging up roots, grubs and other food from the ground (though it can be useful for many other purposes as well; for instance, for making notches in trees to facilitate climbing). Hence the hand-axe (or the Abbevillio-Acheulian) culture was of vegetable and grub gatherers. Desmond Clark[142a] has however recently suggested that these were used as meat mattocks, hence the edges of these tools are rarely found blunted.

Likewise, ZEUNER associated the makers of the large Clactonian flakes and hollow-scrapers with forests, and the Levalloisian and the Mousterians who made beautiful flakes in a specialized manner as typical hunters. For such flakes would be extremely suitable for cutting and dressing carcasses.

MACBURNEY has recently studied the distribution of hand-axes and flakes in Western Europe and has postulated that the hand-axe makers preferred the low, maritime and warm regions, whereas the flake fabricators—the Levalloisian for instance—liked the upland which was comparatively colder. He admits,[144] however, that for the latter assertion the evidence is yet not much.

Two difficulties face us in trying to apply these climatic and ecologic considerations in India. Firstly, we do not have such sharp climatic and regional differences, except the glacial and periglacial areas of the north and the warm or tropical regions of the rest of India, of course, with their varying hill and forest cover.

Secondly, though we do have two separate cultures—one a pebble tool[144a] and flake culture, and the other hand-axe, both of equal antiquity, the former in its initial stages does not belong to a cold phase, unless we accept ZEUNER's suggestion that the second interglacial and others might be mild glacial phases.

142. ZEUNER, F. E., *Dating the Past*, p. 292.

142a. See *Current Anthropology*, 1960, p. 315.

143. MACBURNEY, C. B. M., *The Stone Age of Northern Africa* (Pelican), p. 24 ff.

144. *Ibid.*, p. 26.

144a. Desmond CLARK has recently convincingly shown that the term " pebble culture " has little significance, because at Olduvai, below Bed I and above it, were found in association with hominid fossils, pebble tools as well as flakes and nodules, all forming an integral part of the culture. Thus he proposes that the term " Oldowan Culture " should replace the term " Pebble Culture,". See *ATTI Del VI Congresso Internazionale Delle Scienze Preihistoriche E Protostoriche*, G. C. Sansoni Editore, Rome, 1962, pp. 265-70.

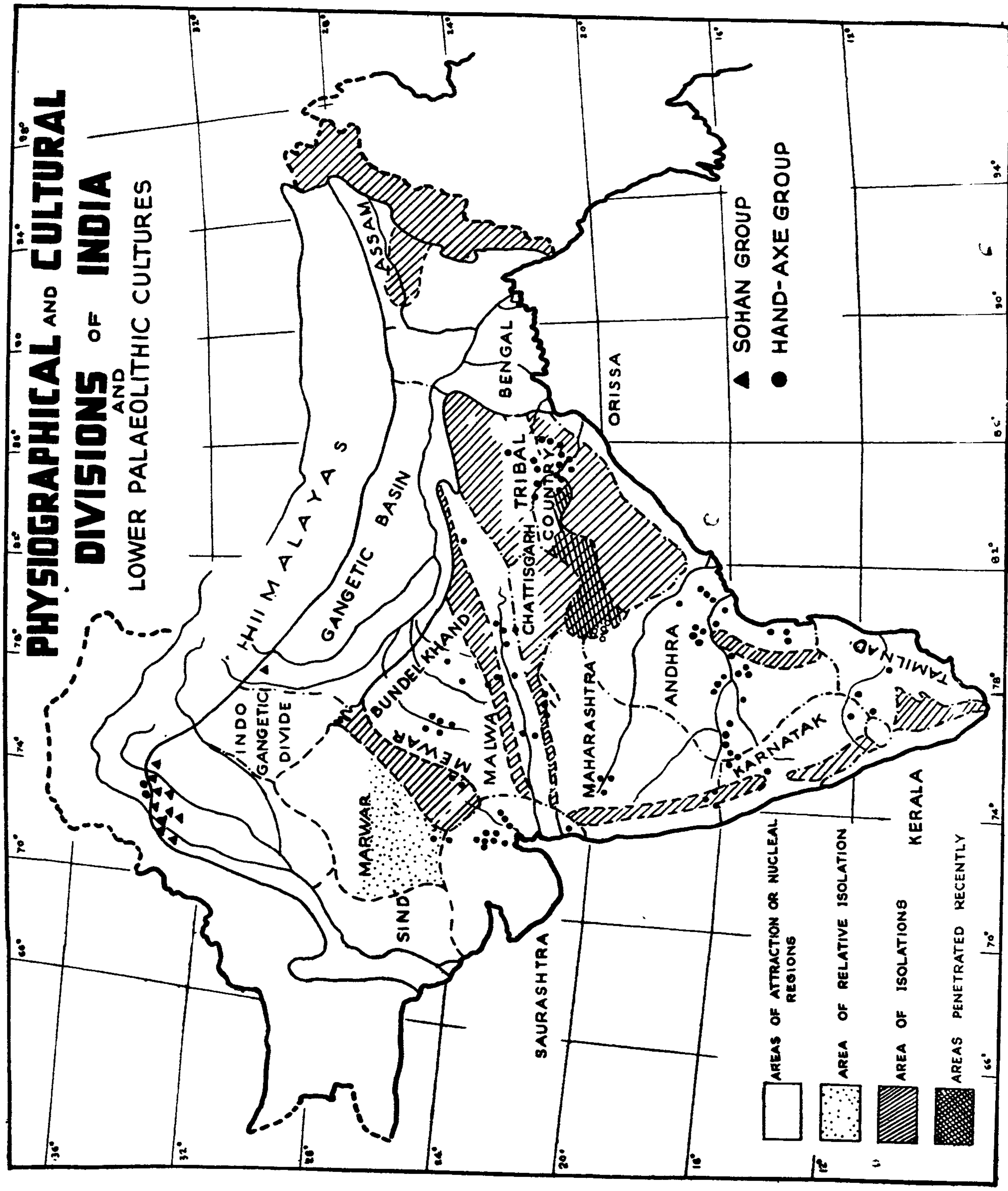


Fig. 33. Map showing the distribution of Lower Palaeolithic sites in relation to the Physiographical Divisions of India. (Add sites in Chanda District, Maharashtra)

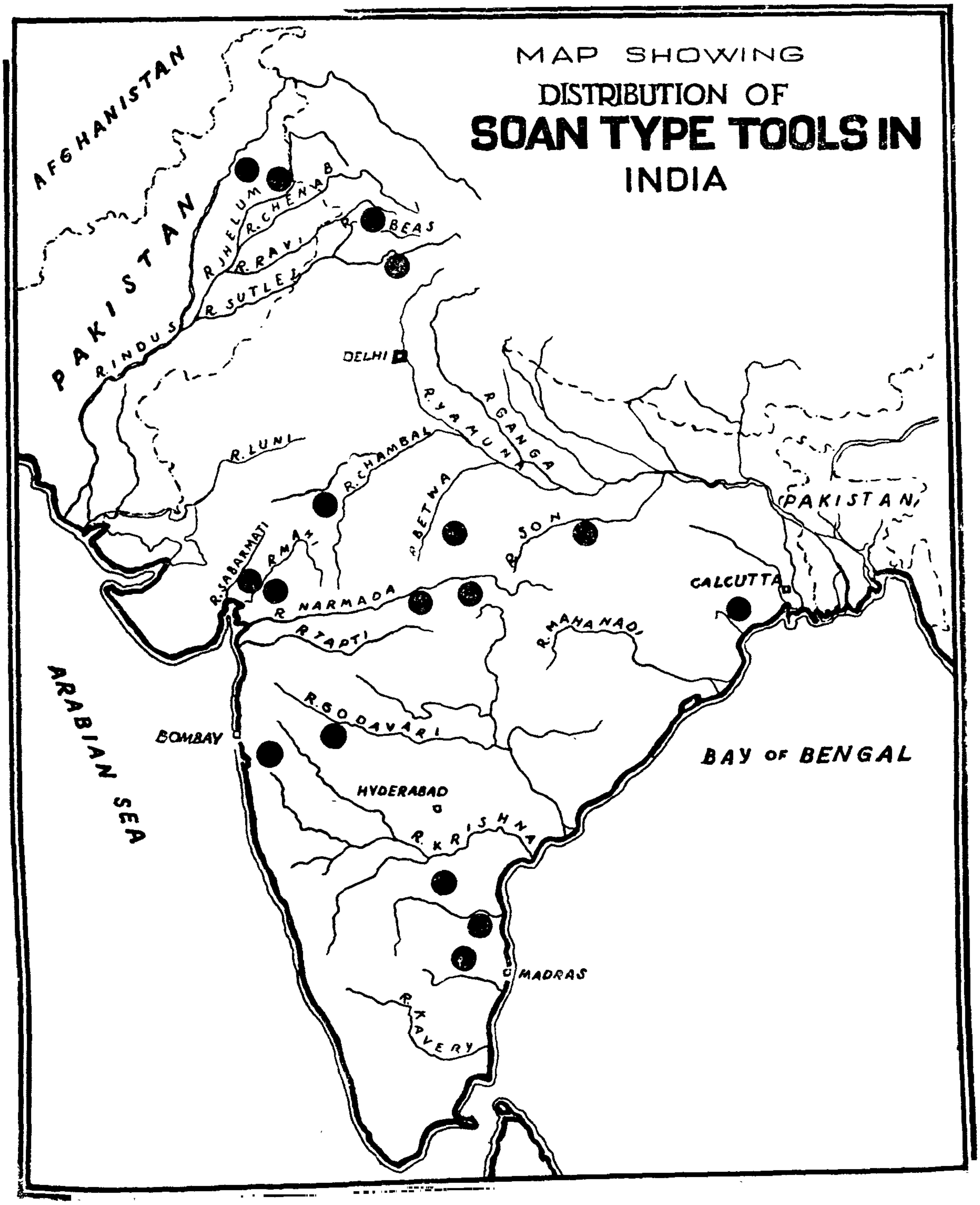


Fig. 34. Distribution of Sohan types of tools in India.

Thirdly, the categories suggested by ZEUNER are not exclusive. The hand-axe people might have avoided thick forests, but it is unbelievable that they subsisted on vegetable and grub alone. They must have been hunters as well. Likewise, the people who specialized in flakes and were supposed to be hunters and forest-dwellers, could not have lived in thick forests, and flourished on animal food alone, granting that their tools were more suitable for cutting and dressing carcasses.

With these proviso, we may emphasize the one or the other way of life, as suggested by the nature of the tools and their ecological distribution.

Sohan Man

Returning to the consideration of two main tool types and their distribution, we may say that Sohan Man preferred the periglacial foothills of the Panjab. Though originally he worked primarily on pebbles, he or his successors gradually took to manufacturing flake tools. Whether it was a natural, indigenous development, or due to new influences or arrival of man himself, cannot be definitely said on the present limited evidence. (*See Fig. 34*)

Who was this Sohan Man racially? In the absence of skeletal remains, no positive answer can be given. But if his tools signify anything, then looking to their similarity with those from Burma, Java and China, it may be surmised that he belonged to the Sinanthropus or Pithecanthropus group. If so, he might have known fire, for the Pekin man knew fire. Probably he also died young, the mean age being 15-16 years; sex ratio was abnormal: 10 males to 8 females.[145]

Hand-axe Man

The distribution of hand-axe suggests that the hand-axe-maker lived on river banks in the open or on the edge of forests, avoiding the interior, upto an altitude of 2,000 feet or so. Higher, bare altitudes or heavily forested ones were avoided, because vegetables as well as animals and even raw material for making tools was scarce. So also water, which was the prime necessity. All these can be easily had in certain regions only. Likewise, lower reaches of the rivers near the delta or near its mouth would be unsuitable for habitation.

On these grounds alone we may explain the non-occurrence of hand-axes from Assam and Kerala. The first is heavily forested, the second is a coastal lagoon. One must, however, warn against facile generalizations. For it is equally true that these regions have not been systematically explored.

The same is true of Sind and Saurashtra. Both have given some data for the existence of Middle Palaeolithic Cultures; so unless Saurashtra was non-existent in Early Palaeolithic times, being under the sea, there is no reason for the non-occurrence of hand-axes there.[145a] For if it was there, whether as an island or as a peninsula, then it lay between Africa and India. Since the former is likely to have influenced the latter during the Early and Later Stone Ages, Saurashtra should provide some valuable evidence, because of its geographical position. Systematic exploration should provide an answer.

145. DUTTA, JATINDRA MOHAN. "Prehistoric Demography", *M.I.*, Vol. 39, p. 269.

145a. The writer noticed two promising sites on the Bhadar, viz. Rojadi and Jetpur, which need careful examination.

The story of Sind seems to be like that of Rajputana. If both these were under a sea, during the Middle Pleistocene times, then no relics of Early Stone Age can be expected. Otherwise, these appear to be hidden in the thick deposits of river silt and windborne sand.

Regarding the environment and the life of *Homo sapiens*[146] who might be the Hand-axe Man, we cannot say much, because we know so little about him personally. No skeletal remains are so far found from India proper, but once again the distribution of his stone tools and great affinity with those from the East and South Africa suggest that the Early Man in India was related physically and culturally to the Early African Man. In the last, not only we have the earliest tools, but its makers called " Zinjanthropus " and pre-Zinj man dated to 1,75,0000 years.[147] That like him he witnessed several wet and dry phases, his first arrival coinciding with a wet phase; we may say practically all over Peninsular India, from Northern Rajputana[148] to Madras in the south and from Bombay in the west to Orissa in the east.

Density of Palaeolithic Population

On the South-East, the great number of sites and their richness imply that the Palaeolithic population was probably much denser in this region than in the west or north, though if we again go by statistical analysis, of fossil remains elsewhere, this population was much less—only 4·2 million for the whole of Palaeolithic world, that is almost equal to the present population of Bombay,[149] though the wide distribution of his tools might be due to the fact that he did not carry the tools with him, but made them, as and when required, on the spot. However, within this limited number, Africa and India could boast of a denser population than Europe, for instance. As mentioned earlier, this man in India or China or Africa never lived beyond the age of 40, the mortality rate being high owing to the nomadic life. With his two main tools—the hand-axe—which must have been held first in the naked hand as the pebble-butt indicates—and the cleaver—he dug up roots of plants, cut trees as well as animal carcasses.

However, these are speculations based no doubt on a few observations among the few remaining primitive peoples in the world. What one would wish is more positive data. This can certainly be had if some more students come forward from different parts of India and seriously take to the search of stones and fossils in rivers and caves. Then only we shall truly know about the First Man in India and his successors.

146. There is no surety; the evidence is based on one skeleton from Swanscombe in England. ZEUNER, therefore, would not generalize on this slender data. He thinks that the *Homo sapiens* was undoubtedly connected with Upper Palaeolithic cultures. See ZEUNER, *op. cit.*, p. 305.

147. *National Geographic*, October 1961, p. 568.

148. In fact, it extends upto the Potwar Plateau in the Panjab where his tools occur in the deposits of the 2nd Interglacial deposits, and then later at Chauntra.

149. For details see CLARK, GRAHAME, *Archaeology and Society*, London, 1957, p. 241 ff.

CHAPTER II

MIDDLE PALAEOLITHIC CULTURES OF INDIA

Middld Stone Age

TILL very recently, so late as 1954, it was not possible to say what happened to Early Palaeolithic man in India. For except in the north-west Panjab, Kandivli[1] near Bombay and in Kurnool in Andhra Pradesh, the layers lying above those which contained hand-axes and cleavers were supposed to be barren. No doubt, there was a large number of several groups of tools collected and exhibited in a few museums. But their cultural significance was not known, as they were all from the surface. Thus except for the three regions mentioned above, the rest of India seemed to have passed from the Early Palaeolithic right into sub-recent times. It was therefore said by an American that there was almost complete ignorance about her (India's) ancient past.[2]

Discovery at Nevasa

Then in 1954-55 tools of quite a different nature and material were discovered at Nevasa on the Pravara, District Ahmednagar. The earlier tools (called initially Series I)—hand-axes, cleavers—were found in a thin basal gravel resting over the rock, while another layer of gravel, fine and less cemented superposed over it, yielded smaller tools (Series II)—scrapers, points and a few blade-like tools on chert and jasper. These have been provisionally called so far "Series II tools."[3] Further search along the Pravara and the Godavari brought to light several sites, the most important being Bel Pandhari, Suregaon and Kalegaon on the Godavari. At the latter, the tools were found embedded in the head of an extinct type of ox, called *Bos namadicus* Falconer in a thick cemented gravel deposit. *Pl. IV*, (*Fig. 43b.*)

Taminhal

These discoveries gave a fresh impetus to other workers in the field. Stratified deposits of such smaller tools were located at Taminhal,[4] where earlier Series I tools had been found *in situ*. This immediately gave a meaning to the large collections previously made by the late Shri Chapghar from Bagalkot on the Ghataprabha and handed over to the writer in 1953-54.

Maheshwar

By persistent search and examination of the area around Maheshwar on the Narmada, District Nimad, Madhya Pradesh, it was ascertained that Series II tools belonged to the gravel phase of Terrace II at a height of about

1. See however below p. 113 for our latest observations, according to which Kandivli has one or two main deposits, but the industry is primarily of one type.

2. William Howell in the *American Museum of Natural History*, Science Series, British Edition, 1947, p. 245. cited by Fürer-Heimendorf in *Man in India*, Vol. XXVIII, 1948, p. 197.

3. Sankalia, H. D., *A. I.*, No. 12, 1956, pp. 35-52.

4. Banerjee, K. D., *Middle Palaeolithic Industries of the Deccan*, Ph.D. thesis in Archaeology, Poona University and Deccan College Library, 1957, p. 41 and Joshi, R. V., *Pleistocene Studies in the Malaprabha Basin*, Poona, 1958.

60 ft., the first terrace being 80 ft. (*Fig. 37.*) Here again the tools are found in fairly well cemented gravels, whereas huge factory sites lie further away to the north and south at Choli and Dongargaon respectively.

Other Regions

Students of the Deccan College have traced such tools in their survey of the river valleys in Malwa, Central India, Southern Rajputana, Orissa and Kurnool, whereas members of the Archaeological Department, Government of India and Bombay, discovered such tools in Saurashtra, Madhya Pradesh and elsewhere. Wherever good sections exist and have been carefully examined, for instance Nevasa,[5] Kalegaon, Bel Pandhari, Nandur Madhmeshwar on the Pravara-Godavari in Ahmednagar District, Taminhal on the Malaprabha, in North Karnatak, in Kurnool at several sites, at Bijatala and Kandha on the Khadkai and others in Orissa,[6] in Madhya Pradesh,[7] at Mandasor, Nahargadh on the Sivna, these tools occur in " middle gravels," above the bed of a highly cemented pebbly gravel and separated at times by a layer of yellowish silt and below a layer of fine gravel, capped by yellowish silt. In Western Rajputana the conditions are different.[8] Here in the Luni and its tributaries—at Shrikrishnapura, Khari, Dundara—the tools are found in the *only* gravel that is found in the region, though it is capped by silt and sand and rests on the rock.[8a]

Stratigraphy

At a few sites, for instance Nevasa on the Pravara, Nandur Madhmeshwar on the Godavari, Maheshwar on the Narmada, and Tandrepadu, opposite Kurnool, the tools can be confidently co-related to Terrace II. Little doubt thus now exists about the stratigraphical position of the industry comprising these tools. It succeeds the Hand-axe and precedes the Blade-and-Burin Industry in Kurnool and Bombay area and possibly in Orissa, Madhya Pradesh, Maharashtra and Karnatak. In all these regions the latter industry is not yet available in abundance and in stratified deposits.

Nevasian

For this reason, it has been proposed to call the assemblage and the cultural stage it signifies " Middle Palaeolithic," or "Nevasian " after the type site, Nevasa.[9] The term "Middle Palaeolithic" has both a chronological and typo-technological significance, and has nothing to do with the European term and culture " Middle Palaeolithic " or even the African, with both of which some of its tool types show a certain amount of resemblance.

5. SANKALIA *et, al, From History to Prehistory at Nevasa*, pp. 102 and 528.

6. MOHAPATRA, G. C., *The Stone Age Cultures of Orissa*, Ph. D. thesis, Poona University and Deccan College Library Poona, 1960. pp. 79-81.

7. KHATRI, A. P., *Stone Age Cultures of Malwa*, Ph.D. thesis, Poona University and Deccan College Library, Poona, 1958, p. 163.

8. See MISRA, V. N., *The Stone Age Cultures of Rajputana*, Ph.D. thesis in Archaeology, Poona University and Deccan College Library, 1961, pp. 50-56.

8a. See, however, below p. 98.

9. BANERJEE, K. D., *op. cit.*, p. 135.

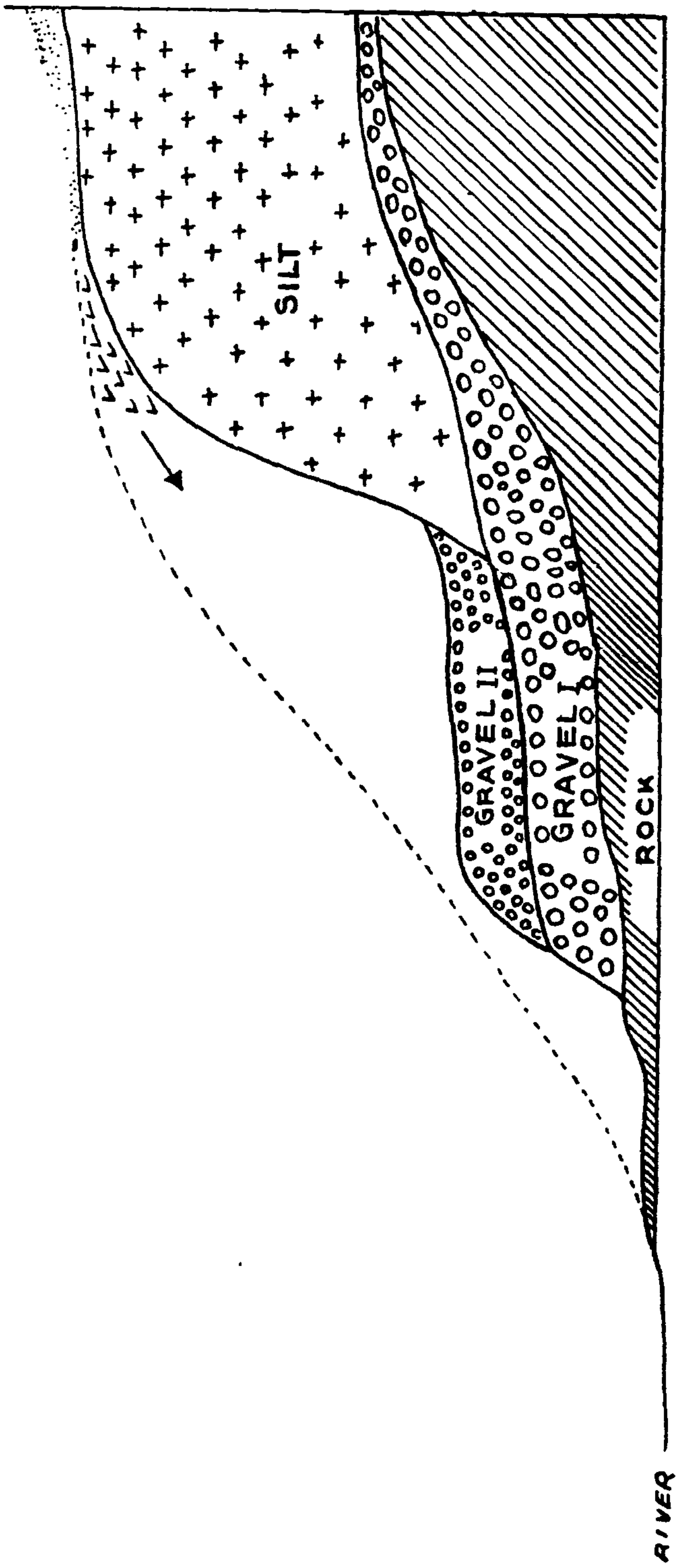


Fig. 36. Section on the Pravara at Hathi Well site, near Nevasa (suggested reconstruction).

Middle Palaeolithic or Middle Stone Age (?)

It has been urged[10] that the term "Middle Palaeolithic"[11] should not be used for this industry, for it immediately makes one compare it with its namesake in Europe, and the term "Middle Stone Age" be used instead. In the first place, the term "Middle Palaeolithic" may by usage remind one of the European, but these are most simple, common terms, and not like the words 'Acheulian' or 'Aurignacian,' after a particular French site which connote a particular type of culture, that their use should be confined to Europe. The alternative suggestion "Middle Stone Age" is also in imitation of an African practice, and thus not free from similar objection. Moreover, the African analogy does not help, because there the term "connotes a large group of cultures, differing from region to region and with different names, but all having a great deal in common with regard to technique and typology...."[12] Secondly, there is a "lack of sufficient stratigraphical evidence," whereas in India, the stratigraphical position restricts it to the "middle gravels," which succeed the Middle Pleistocene, almost everywhere, and on the present palaeontological evidence can be dated to the Middle Pleistocene, but may be placed in the early Late Pleistocene. According to one suggestion,[13] the industry might be regarded as a "Flake Culture" of the Lower Palaeolithic. This suggestion satisfies the palaeontological evidence, but not the stratigraphical and typo-technological. Until better, more positive, evidence is available to place the culture later (or earlier ?), this new Stone Age Culture should be called "Indian Middle Palaeolithic" or "Nevasian." It falls in the early Late Pleistocene period, when under a wet phase, practically all over the the Peninsular India, the rivers deposited over or *against* the older gravel or silt, a comparatively finer gravel. This formation occurs as a low Terrace (T2) at Maheshwar, Nevasa, Mehenduri, Nandur Madhmeshwar, and Tandrepadu, opposite Kurnool. In the last region, there are other sites, where too this second deposit occurs banked up against the older, but not as a distinct broad terrace. (*Figs 36-37.*)

Evidence

The palaeontological evidence is not negligible, though based on one solitary find only and confined to one river valley. At Kalegaon, the tools

10. Subbarao, B., *The Personality of India*, 2nd Ed. Baroda, 1958, p. 39 and after him Allchin, Bridget, "The Indian Middle Stone Age : Some New Sites in Central and Southern India, and their Implications" in the *Bulletin* of the London Institute of Archaeology Number, II (1959), p. 1 (of the reprint).

11. There is in fact no logical contradiction beween the terms "Middle Stone Age" and "Middle Palaeolithic". In the former, the entire Stone Age is divided into three subperiods : (*i*) Early Stone Age, (*ii*) Middle Stone Age and (*iii*) Late Stone Age. In the latter, the Old Stone Age itself is divided into three sub-pariods ; (*i*) Early or Lower Palaeolithic, (*ii*) Middle Palaeolithic and (*iii*) Late or Upper Palaeolithic. Thus the former is more extensive in its connotation and applications. The latter has a limited and precise meaning.

The difficulty arises when the Early Stone Age is equated with the Early or Lower Palaeolithic, and the Middle Stone Age with the Mesolithic, which is regarded as a transitional period between the Palaeolithic and Neolithic. The propounders of the term "Middle Stone Age" think that there is no sufficient evidence to place the recently discovered industry or industries (to be described) in the Palaeolithic period or within the Middle or Late Pleistocene. And therefore it is advisable to have a term of wider connotation. For the reasons mentioned, it is, I think, unnecessary to adopt a term which is not precise. For if it is agreed that the industry denoted by Series II falls within the Pleistocene and is thus Palaeolithic, and its earliest occurrence is in the middle gravels, and in character the industry is not only different from the earlier handaxe industry, but has its own individuality and further leads on to the blade industries of the succeeding period, then the name 'Middle Palaeolithic' admirably brings out its stratigraphical horizon and cultural stage.

12. Malan, B. D., "The Term 'Middle Stone Age' in the *Proceedings of the Third Pan-African Congress on Prehistory*, 1955. pp. 223-27.

13. Prof. F. E. Zeuner in his Report on Dr. K. D. Banerjee's thesis in Archaeology on the *Middle Palaeolithic Industries of the Deccan*, submitted for the Ph.D. degree of the Poona University in 1957.

were in close association with—actually embedded in the skull and horn of *Bos namadicus* Falconer, found in a 8-10 ft. thick, well cemented gravel, consisting of tiny trap pebbles, chunks of agate, chalcedony etc. Other fossil remains have also been found by a member of the Geological Survey of India from the same region in 1959-60, but not yet reported, whereas Dr. KHATRI reports similar discoveries on the Narmada at Devkachar and Barman Ghat.[13a]

The composition of the gravel elsewhere is similar, though not fossiliferous. In Kurnool, and elsewhere on the East Coast, where the gravels are reddish owing to staining or lateritization, the same distinction, between the older, old and comparatively recent gravels can be made.

Thus lithologically and stratigraphically the gravels that yielded Middle Palaeolithic tools have a distinct individuality.[13b]

Mode of Occurrence

Before turning to the tool-types, one other point needs clarification. These tools are often found in fields with black or brown soil (as in Central India around Maheshwar, Kasrawad, Choli and Kurnool), and therefore it was at one time thought that these being surface occurrences, are late. Very often the tools occurred together with microliths. Hence they were thought to be microlithic. Careful observations in three regions—parts of Maharashtra, Central India, and Andhra—have shown that wherever the soil cover is thin and immediately overlies the gravels, or wherever there are veins of jasper and chert, with factory sites, as for instance at Dongargaon and Choli near Maheshwar, or Khadki Mata near Mandasor, the black soil which is a later formation—is full of nodules, cores, and large flakes and tools of Middle Palaeolithic industry.[13c]

Since the Microlithic and the Chalcolithic cultures succeeded—though after a long time—the Middle Palaeolithic, and their practitioners occupied the same sites, *at some places only* we find an admixture of several cultural groups. But this in no way indicates the lateness of all the tools.

Environment

The Middle Palaeolithic Culture so far consists of various types of tools, and at two or three sites in association with an extinct fauna consisting of the wild ox and other bovids. While the gravels in which the tools are embedded indicate a comparatively wet period, the climate seems to be less humid than in the first wet phase. However, the tools suggest a considerable change and difference in the life—and possibly environment—of the men who made them. Light forested region seems to have been preferred.

13a. Likewise tools with remains of *Bos* and *Elephas* have been reported from stratified deposits at Siddeswar in Parbhani District and some unidentified fossils on the Wardha at Walgaon in Wardha and Amaroti Districts. *I.A.R.*, 1960-61, pp. 63-64.

13b. This is also the observation of Dr. JOSHI in the Kopra Valley, Damoh region. *A.I.*, No. 17 (1961), p. 21.

13c. Many more factory sites have been discovered elsewhere on the Narbada and in Ahmadnagar District. *I.A.R.*, 1960-61, p. 60 and p. 19.

Tool Size

First the size and material. Contrary to the general impression that the Middle Palaeolithic tools are small, it must be said that in size, they are only relatively " small." While some may be as small as one inch (about three centimeter), the largest is as big as six to eight inches (about 15 centimeter) in length and about three to four inches in width and about an inch in thickness. Thus these tools are in no sense microlithic.

Raw Material

The raw material differs from region to region, but even here there is a distinct uniformity which unites all the regional groups. What the man needed was a fine-grained material. So while all over the Deccan, where there are veins of jasper, chert etc. in the basaltic trap, the material is invariably this, whether it be Maharashtra, Central India—West or East—and Saurashtra. Even elsewhere, for instance in Orissa, Andhra or Mysore (North Karnatak), it is the jaspery, brownish chert or jasper which is the preferred material, though in Kurnool, sometimes quartzite is also used. In Western Rajputana and north Central India outside the Malwa plateau (which is of trap), the preference is for flint or flint-like chert or jasper, which is yellowish and patinated beautifully like flint.

Techniques

New techniques are also visible in the preparation of tools. In the preceding phase of the Stone Age, tools were made on either flakes removed from huge cores or on pebbles or on the core after the removal of the flake, first by 'free' and later by 'controlled' method of flaking. Thus the resultant flakes had high angles and prominent bulbs, and the cores showed deep flake scars, whereas controlled flaking had left 'steps' either along the margin or on the face of the finished product. Occasionally the flakes show the preparation of the striking platform, but so far " tortoise cores " have not been reported (from the hand-axe area), so that we cannot say definitely that the full Levallois technique was known or employed in the manufacture of flakes.

In the Middle Palaeolithic of India, the one thing that strikes a student is a mixture of several techniques—old and new. While the old techniques mentioned above persist (as may be seen in some cores as well as flakes) and this is quite natural, among the newer methods are visible (*a*) flakes with faceted platform, (*b*) flakes removed by a pointed punch-like instrument which has left very tiny platform and small prominent bulb with the encircling ring. This is usually prominent in very fine-grained material. (*c*) Round, oval or triangular flattish flakes with prepared platform and with previous work on the core heralding the true Levallois technique. The corresponding cores are also at times available. (*d*) Use of flat or suitable nodules or cores very often with cortex which have been turned into thick pointed borer or borer-cum-hollow based scraper, by careful (or casual) retouch. (*e*) Occasional occurrence of small hand-axes on jasper or points (borers) on large-sized flakes or even on pebbles of quartzite. But on the whole hand-axes and cleavers are absent. If the hand-axe is the type tool of the Lower or Early Palaeolithic, the borer or borer-cum-

scraper may be regarded (in our present knowledge) as the type tool of the Middle Palaeolithic.[14]

The retouch along the edge or both sides of the borer is also an invariable feature. But it is not necessarily fine or regular. What was intended or required was a thick or thin point and a scraping edge. And these have very often been obtained by a minimum of effort, leaving large scalloped retouch scars on the edges of the tool.

Flake Culture (?)

Tools on flakes are indeed in a majority and statistically the Middle Palaeolithic may be called a " flake culture." But the flakes were not regarded as absolutely essential, particularly the Levallois type. Any flat piece—flake, nodule or core—was good enough for being converted into a borer or a scraper. Hence it is not a true flake culture like the Middle Palaeolithic of Europe and Africa. Impression is thus left that the man during this period was clever and capable, but probably idle. Rarely did he exert himself fully so that artistic pieces are few.

Disturbing as these mixed features might appear to those who are accustomed to observe certain marked features *only* in any past cultural assemblage, because of selective collection or any other prediliction on the part of the collector, it is these features which characterize the Middle Palaeolithic culture wherever some systematic work has been done—either Maharashtra, Orissa, Rajputana, Central India or Andhra. It is possible that with further work distinction in tool types and techniques corresponding to stratigraphical subdivisions will be made, so that we shall have divisions in the main Middle Palaeolithic or some types will be relegated to the Lower or Upper Palaeolithic respectively.

Tool Types

The main types of tools are as follows :

(1) Scrapers of several types such as : (*a*) Single hollow-sided scraper, (*b*) Double hollow-sided scraper, (*c*) Straight-sided scraper, (*d*) Scraper-cum-point or borer, (*e*) End Scraper and (*f*) Side-and-End scraper.
(2) Points (including arrowheads)
(3) Borers
(4) Points, borers and even scrapers with incipient tang.

Their relative proportion is available from Maharashtra, Northern Karnatak, Malwa, Southern Rajputana, Orissa and Kurnool, where systematic work has been done so far, and the results can be readily inspected.

Maharashtra

The most important stratified sites in Maharashtra are Nevasa, on the Pravara and Bel Pandhari, Suregaon, Kalegaon and Nandur-Madhmeshwar on

14. Thus the situation reminds one in Western Europe, where Movius sub-divides the Lower and Middle Palaeolithic on typological grounds as marked by the presence or absence of hand axes or bifaces, *Anthropology Today*, p. 166.

the Godavari. It may be recalled that it was the last mentioned site which had yielded these tools *in situ* gravel in 1943.[15] Barring Nevasa (where thin deposits of earlier cemented gravel are left), and Nandur-Madhmeshwar where earlier gravel lies in the river bed and also Bel Pandhari where in the recent visit with Professor ZEUNER earlier deposits and tools were discovered in a nala, elsewhere only thick deposits of this (second) gravel are visible, banked up against the silty cliff section. This also suggests their late, subsequent deposition in a comparatively wet phase, sometimes on an eroded earlier gravel. In composition and appearance this gravel is different from the earlier (Gravel I) and the later (Gravel III). Nodules and pebbles of the secondary minerals like jasper, chalcedony, zeolite are prominently seen, whereas those of trap are rare. Cross bedding is common. It is believed to be laid down in shallow water.[16]

At Bel Pandhari, Kalegaon and Nadur-Madhmeshwar on the Godavari the gravel rises to height of nearly 10 ft. from the water level, whereas at Neavsa at Locality I (about 4 furlongs to the west of the Ladmod mound and opposite the BAROT's well on the opposite side), Locality V (Hathi well—west) and Locality VII (just below the excavated mound of Ladmod), the second gravel rests upon thin deposits of earlier gravel.

On the three Godavari sites, the gravel appears as a ledge away from the yellowish-brown silty cliff. It was formerly inferred by Banerjee and me that this silt rested on the gravel. However, my subsequent examination of the Godavari-Pravara Valleys, almost right from their source upto their confluence and beyond, seems to indicate that as in the Narmada the earliest gravel phase in these rivers was capped by a very thick deposit of yellowish silt. And this forms the first or the highest (or the oldest) terrace. In the subsequent cycles of wet and dry phase, the river never reached this height. The gravel and silts when deposited were banked up against this cliff. This formed Terrace II. And because of its low position the gravels of this terrace are eroded, and except at a few places mentioned above, lie scattered in the present river bed.

In the Hathi Well locality at Nevasa the gravel and silt seem to be plastered over the partly eroded and exposed earlier gravel and its silty cliff. This was further covered by a thin deposit of loose kankary gravel during the latest aggradation, at many places along these rivers as well as on the Narmada. In fact this seems to be a feature in Peninsular India, for it has been observed by me on the Chambal and Narmada in Central India as well as in Kurnool.[17]

If these observations are correct, then the sections at Nevasa, Bel Pandhari, Kalegaon and Nandur Madhmeshwar should be drawn as shown in *Fig. 36.*

Since 1955 several small *in situ* collections have been made, particularly from Nevasa, Bel Pandhari and Nandur-Madhmeshwar, whereas tools have also

15. SANKALIA, H. D., " Studies in the Prehistory of the Deccan, A Survey of the Godavari," *BDCRI*, IV (1944), pp. 186-98.

16. BANERJEE, *op. cit.*

17. Even at Poona the section on the right side of the Bund Garden shows a fairly thick bed of pebbly gravel capped by a thick deposit of yellowish silt. If this belongs to one wet and dry cycle, as agreed to by Professor ZEUNER, then the subsequent deposit of a finer gravel must be at a lower level. The latter now lies eroded in the river bed up and down stream.

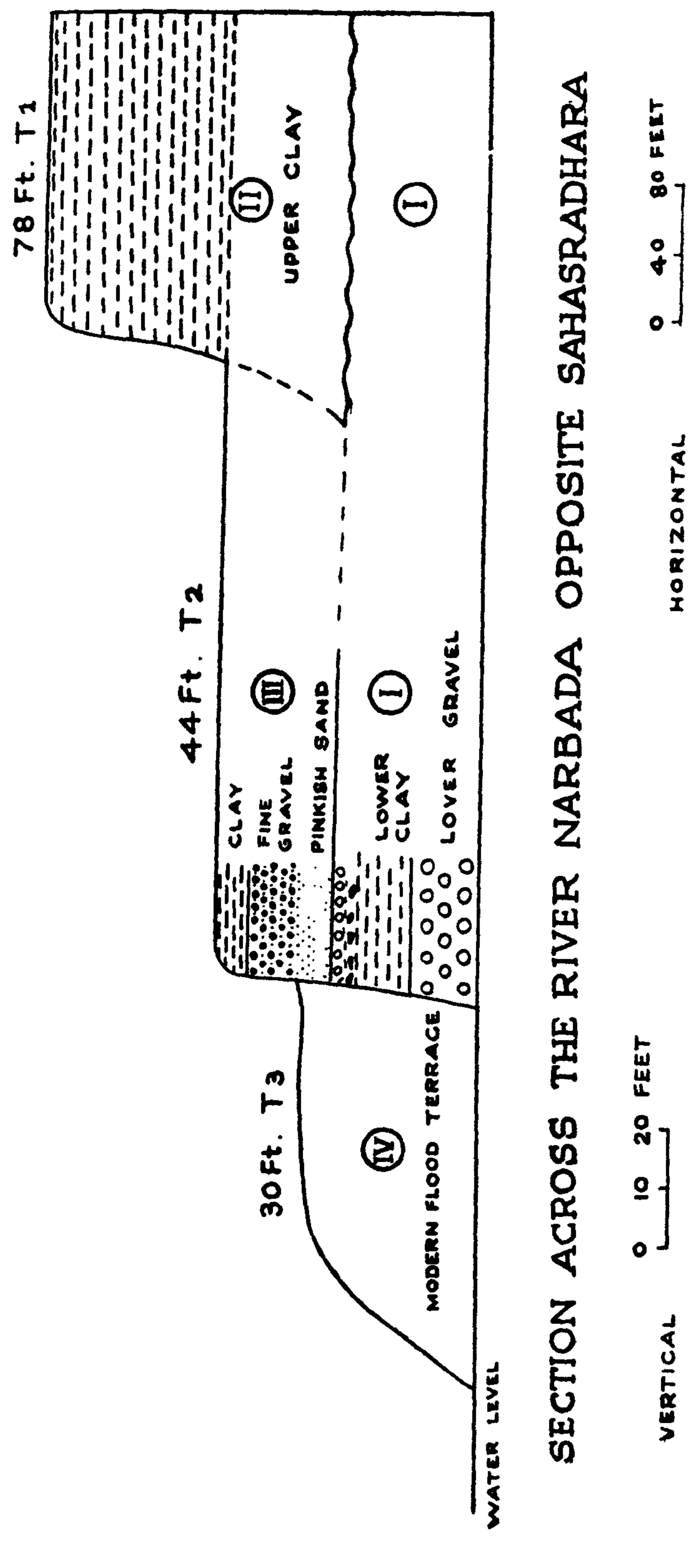

78 Ft. T1
II
UPPER CLAY
I
44 Ft. T2
CLAY
FINE GRAVEL
III
PINKISH SAND
LOWER CLAY
I
LOVER GRAVEL
30 Ft. T3
IV
MODERN FLOOD TERRACE
WATER LEVEL
SECTION ACROSS THE RIVER NARBADA OPPOSITE SAHASRADHARA
VERTICAL 0 10 20 FEET
HORIZONTAL 0 40 80 FEET

Fig. 37.

been collected from the gravel heaps on the Mula-Mutha at Poona (Bund Garden). Koregaon on the Bhima, about 16 miles north from Poona, and the gravels which have been brought from this place and spread in the compound of the Deccan College and adjoining golf ground. Other regions like Talegaon on the Indrayani and several sites on the Tapi in Khandesh[18a] and several sites in Vidarbha[18b] have yielded similar tools.

Tool Percentage

Since this collection goes on increasing every year, it is not statistically treated. For the present, the figures arrived at by BANERJEE are given here.[18] Of the total collection of 1851, nearly half is a stratified number from Bel Pandhari, Kalegaon, Nevasa and Nandur-Madhmeshwar. And of the entire collection only about 21 per cent consists of regular tool types, leaving out cores, flakes, utilized nodules and rejects. This small assemblage includes only four main tool types :

I	Points	... ...	15·7% (60)
II	Scrapers	... ...	57·3% (219)
III	Borers	... ...	24·9% (95)
IV	Scraper-Borer	... ...	2·1% (8)

Points

The points are further sub-divided into :

(*a*)	Simple Points	... ...	(73·3%, 44)
(*b*)	Tanged Points	... ...	(26·7%, 16).

Simple Points (*Fig. 38*)

The first—simple points—may be further split up into a number of groups according to the nature (core or flake), shape, position of the bulb (if any) and nature of retouch. This will give a large number of sub-groups[19] and an insight into the character of the industry. Suffice, here, to emphasize the fact that its makers have not been particular in having only certain kinds or types of cores or flakes. Any suitable piece of stone was used. It is this aspect which is sought to illustrate while citing the specimens.

(1) Thin, leaf-shaped point on a Levallois-like flake, simple faceted platform, but the upper surface has a very shallow roughly parallel-sided flake scar ending in a point; wavy edge on both sides marked by scalloped and flattish irregular retouch from either surface. The tool may also pass off as a scraper-cum-borer, if held horizontally; for one of the longer or lateral undersides has two tiny notches removed to give a small borer-tip. But this process was never completed. No. 283, Nevasa (NVS), Loc. II, surface, brownish jasper.[20]

18. For a complete analysis and statistics, see, *ibid.*, p. 145.

18a. *I.A.R.* 1956-57, p. 11 and Fig. 5.

18b. *I.A.R.*, 1960-61, pp. 63-64.

19. BANERJEE, *op. cit.*

20. See, SANKALIA, H. D., *A.I.*, No. 12 (1956), p. 49, fig. 10, no. 283 and BANERJEE, *op. cit.*, p. 158, pl. 4 d. It may be mentioned that this was the first definite tool type, which led to the later systematic investigation at Nevasa.

(2) Sub-triangular point on a thick Levallois-like flake, about 90° angle, platform faceted, diffused bulb. Upper surface has a regular mid-ridge, almost up to the butt, which has shallow scars probably to facilitate hafting. Rest of the three sides bear steep minute retouches from the upper side. No. 113, Kalegaon (KG), *in situ* gravel, mottled jasper.

(3) Small triangular point on a flake, with uneven undersurface, mid-ridge on the upper, with a sloping flaked butt. No. 325, Bel Pandhari (BPD), coarse quartz with greenish specks.

(4) Small, roughly oval point on flake, bulb portion steeply flaked away from the underside. Upper has a mid-ridge, which is partly removed at the pointed end. Steeply retouched on both sides, but the left has a thick encrustation. No 380, BPD, *in situ gravel*, greenish jasper.

(5) Small point on a flat, heart-shaped, Levallois-like flake, faceted butt, 90° angle. A broad angular point achieved by two shallow flakes, on the angular side. No, 113, NVS, fleshy jasper.

Tanged Points (*Fig. 38*)

These are indeed rare and probably the first of their kind to be recorded from India. Compared to the Aterian, these are very crude, both the workmanship on the tang as well as on the tip of the point. But the conception was there and can be seen even in scrapers. Two types are distinguished : (*a*) Single-shouldered (*b*) Double-shouldered.

One each from a group of seven and nine respectively are here illustrated.

Single-shouldered Point

(6) A small triangular flattish flake having cortex on the longer side. From the undersurface a large flake was (perhaps previously) removed, giving a flat surface. This tip was then retouched so as to give a point. On the upper surface, from one side of the butt, small nothces have created a shoulder. This could be for scraping also ! No. 389, BPD, green jasper.

Double-shouldered Point or Borer (*?*)

(7) An elongated flake of Levallois type having a simple platform, 90° angle with two or three shallow longish flakes removed from the tip near the bulbar end. Deep scar on the top centre. Tang or the borer point fairly elongated and made by deep notches on one side, the other looks angular.

Since one of the longer sides is retouched, the tool could have been a scraper. But most probably, looking to the bulbar end, and the deep scar (which facilitated handling) it *appears to be a borer.* And the illustration is given accordingly. Calcareous encrustation on one side of the tang or borer point. No. 49, NVS, green jasper.

Borers (*Fig. 39*)

As in Points, a naturally pointed piece—nodule, core, or a flake– was taken and with a little or elaborate retouch (which includes primary removal of the notches on either side of the point and subsequent finer work on it) an ordinary or sometimes an excellent borer was prepared. Four specimens illustrate the main types.

Borer on Flake

(1) Roughly oval Levallois-like flake with a well elongated and thin borer point. This is achieved by notches on either side of the point and on the front of the under surface. Borer-tip further retouched. No. 1, DC (Deccan College compound), glossy carnelian.

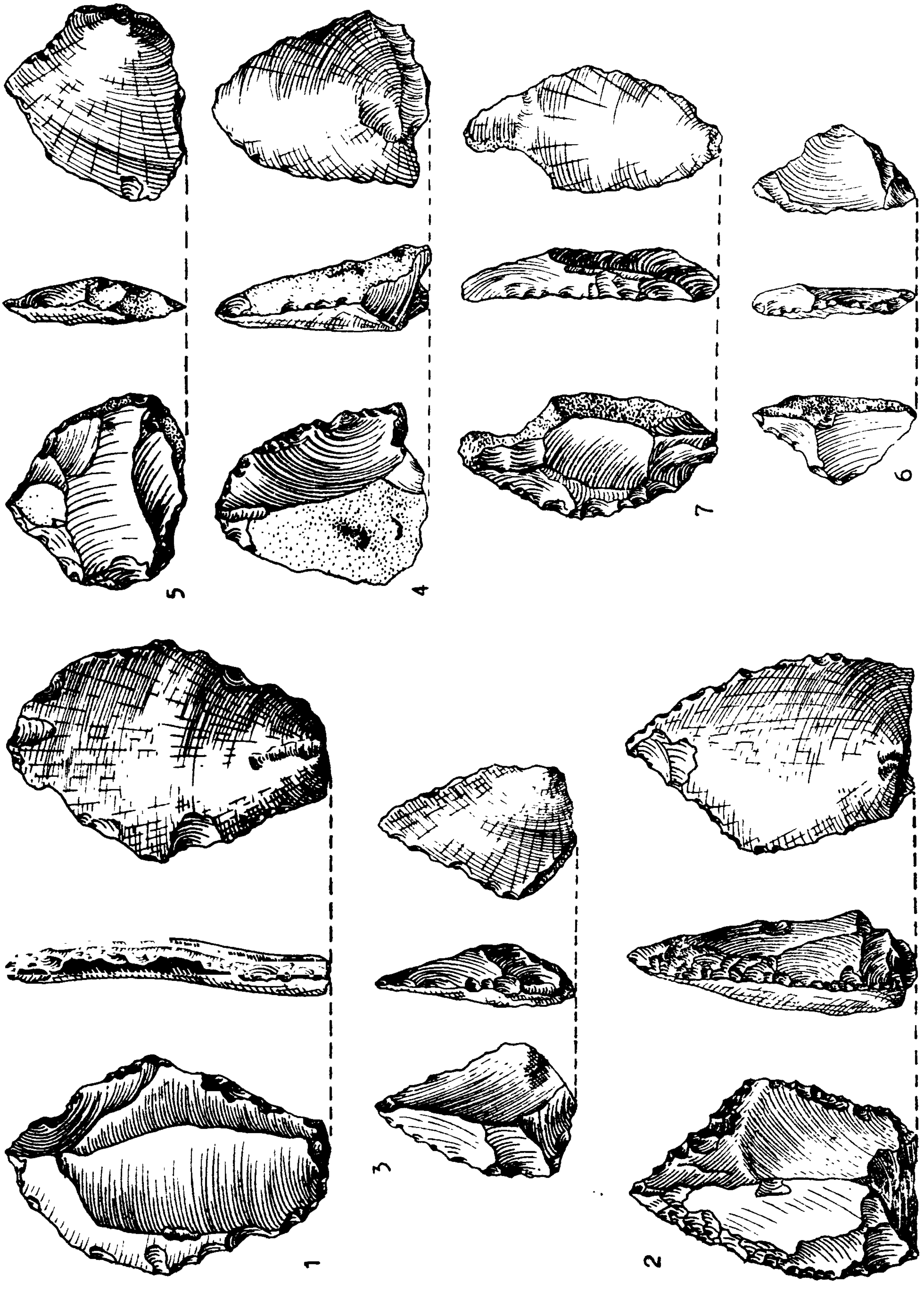


Fig. 38. Points and Scrapers, Maharashtra (1/1)

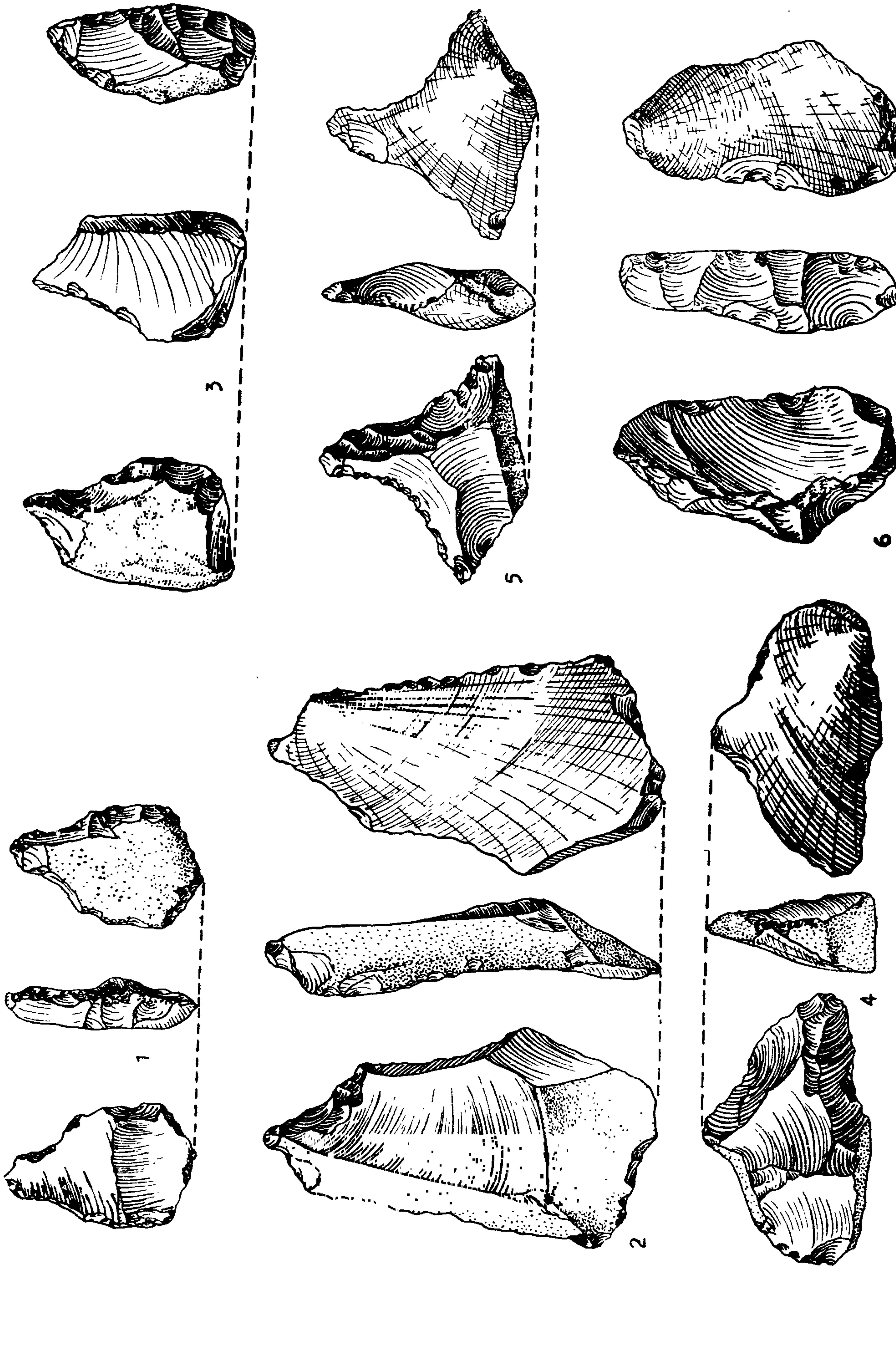


Fig. 39. Borers and Scrapers, Maharashtra (1/1).

(2) Borer on large sub-rectangular flake.[21] The upper surface has two natural facets and one large flake scar; underside primary flake surface, the pointed end hollowed on either side, the longer one being marked by a few bold steep retouches. One straight side bears signs of use. No. 174, KG, *in situ gravel*, banded jasper.

Borer on Core or Nodule

(3) Thick rectangular piece with flattish undersurface, steep sides and uneven upper surface with patches of cortex has been converted into an efficient borer by two deep notches at the pointed end, and the edges have been later perfunctorily retouched. The curved front midridge seems to have been retouched. Chandoli,[22] mottled greenish-red jasper.

Borer on Side Flake

Usually the borer point is at right angles to the longer axis of the tool with a shorter butt-end, but in a number of cases this point is opposite the longer side which is often very thick and serves as a convenient handhold. The specimen described below is of this type.

(4) Borer on thick flake, having bulb and simple platform; the thinner side has a short borer point, by retouching steeply from the upper side of one notch and by retouching from the underside on the other notch; for the thumb-hold a fairly deep flake is removed from the upper surface and the thick back. No. 207, KG *in situ* gravel, jasper.

Borer-cum-Scraper

(5) This is one of the most notable tools in the collecton from Nevasa region. Two deep notches were made on the adjacent sides of a quadrilateral piece. This has given three projections. The main concavities upto the tip of the projection are steeply retouched resulting in double-hollow and triple point borer. Such tools must have been used as spokeshaves for smoothing the shafts of the spear-heads (or arrow-heads).[23] No. 387 BPD, red jasper.

Scraper (Fig. 39 and 40)

Not only is the percentage of scrapers large, but there are a number of varieties. The main groups are: (*a*) Side scraper, (*b*) End scraper, (*c*) Hollow scraper, (*d*) Round scraper, (*e*) Point scraper and (*f*) Borer-cum-scraper.

The last two have been already described while dealing with these two types of tools. Here the main scraper types are given.

Side Scraper

As the name signifies, the scraper edge is on one (lateral) side, parallel to the long axis of the tool, the opposite side being thick or thin and straight or rounded (as in a crescent) or even angular. Thus the exact description of the tool might vary, depending upon the shape.

(6) Side scraper on a thick large crescentic end flake. Slightly rolled, so that the edge which has three or four irregular retouches looks thick and dull. The back or the curved side is very thick and is also deeply flaked. The tool looks like a macrolunate or crescent and even larger ones have been reported from the Tapi and Waiganga Valleys. No. 150, BPD, greenish jasper.

21. Banerjee, *op. cit.*, p. 202, pl. 14, b.

22. On the Ghod River, Poona District. Found on 11-1-1961. The material is identical in every respect with that of the point from Kalegaon.

23. Banerjee, *op. cit.*, p. 210, pl. 14, 0, and Sankalia *et. al. FHPN* (*From History to Prehistory at Nevasa*) fig. 60, no. 10, (The site number differs).

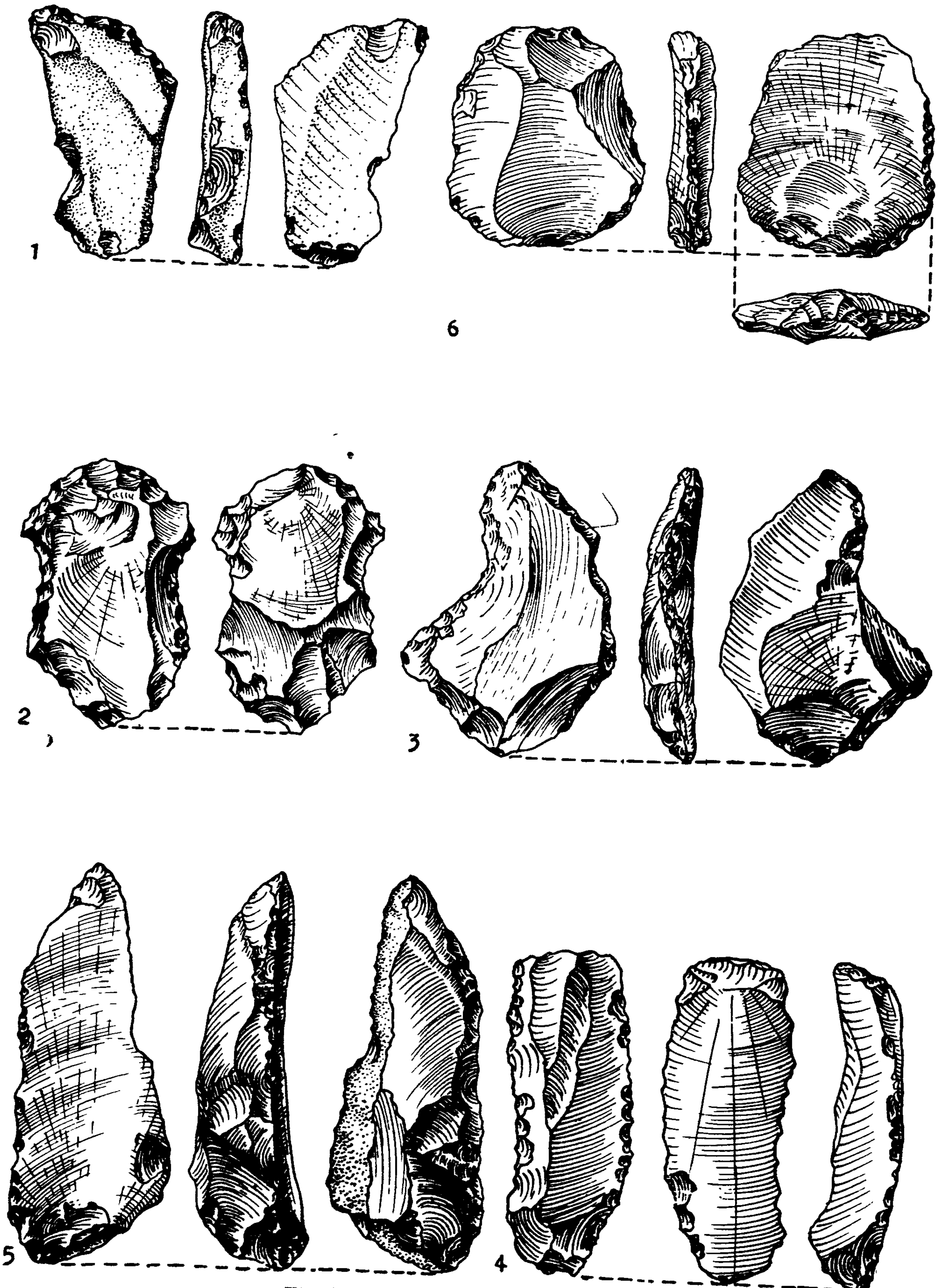


Fig. 40. Scrapers, Maharashtra (1/1).

End Scrapers (Fig. 40)

These are on thick, or thin, flat-based pieces, not necessarily specially made flakes.

(1) End scraper on a thick flake. Only the front fan-shaped, convex side is retouched in a rather large, but regular retouch. No. 124, BPD, greenish jasper.

Hollow Scrapers

These are on thin or thick flat-based pieces which may be flakes, cores or nodules. At times both the hollow front and the hollow back or straight sides are also retouched, giving us a double-edged hollow scraper.

(2) A fine double-edged hollow scraper on a flat Levallois-like end-flake, having a faceted butt. The thick curved back is specially prepared and further retouched, as also the front hollow edge. No. 554,[24] NVS, Loc. II, *in situ* gravel bed II. Chert (partly patinated).

Double-edged Side Scrapers

(3) Hollow and Side Scraper on a thick crescentic end flake, unfaceted platform, bulb and some portion erased. The curved back is steeply retouched either for hafting or for scraping. The opposite side was either hollowed or was naturally so, but has been subsequently retouched. Fine specimen. No. 316, NVS, greenish chalcedony.

(4) Fine blade-like end flake, which has been further slightly cross flaked on the underside at the butt, and on the upper at the shorter end, has been extensively retouched (though partly the edge looks battered due to use) on both the longer sides from the upper surface. No. 468, NVS, Loc. I, *in situ* gravel III; brownish mottled chalcedony.

(5) Side Scraper on a thick long blade-like flake. One of the lateral sides retains cortex, but the other slopes steeply and has been likewise retouched, No. 150, BPD, mottled jasper.

Round Scraper

(6) On a thin, roundish, perfect Levallois flake, having a faceted platform, and a thin triangular flake from the upper surface, removed while trimming the core. The edges all round have been partly retouched. No. 374, Loc. I, NVS, mottled greenish yellow chert.

Karnatak

In North Karnatak so far only one or two stratified sites are known, the most important being Taminhal (TH) and Almatti (AM). At Bagalkot (BGKT) a thick loose deposit of second smaller gravel rests over and against the older gravel, which is also loose and spread in the river bed.[26a]

BANERJEE[27] notes that the Karnatak Middle Palaeolithic Industry (called " Karnatak Nevasian " by him), is characterized by a high percentage of irregular flakes, cores, and nodules, the main tool types being points having various

24. See SANKALIA, *A.I.*, No. 12, p. 47, fig. 9.

25. *Ibid.*

26. *Ibid.*, p. 49, fig. 10.

26a. Very interesting tools have been reported from Salvadgi etc. in Bijapur District. Some of these were exhibited by Dr. SESHADRI in New Delhi last year. If found in a stratified context, these will add materially to our knowledge of this and the succeeding culture. *I.A.R.*, 1960-61, p. 64.

27. BANERJEE, *op. cit.*, p. 255, pl. 6, g.

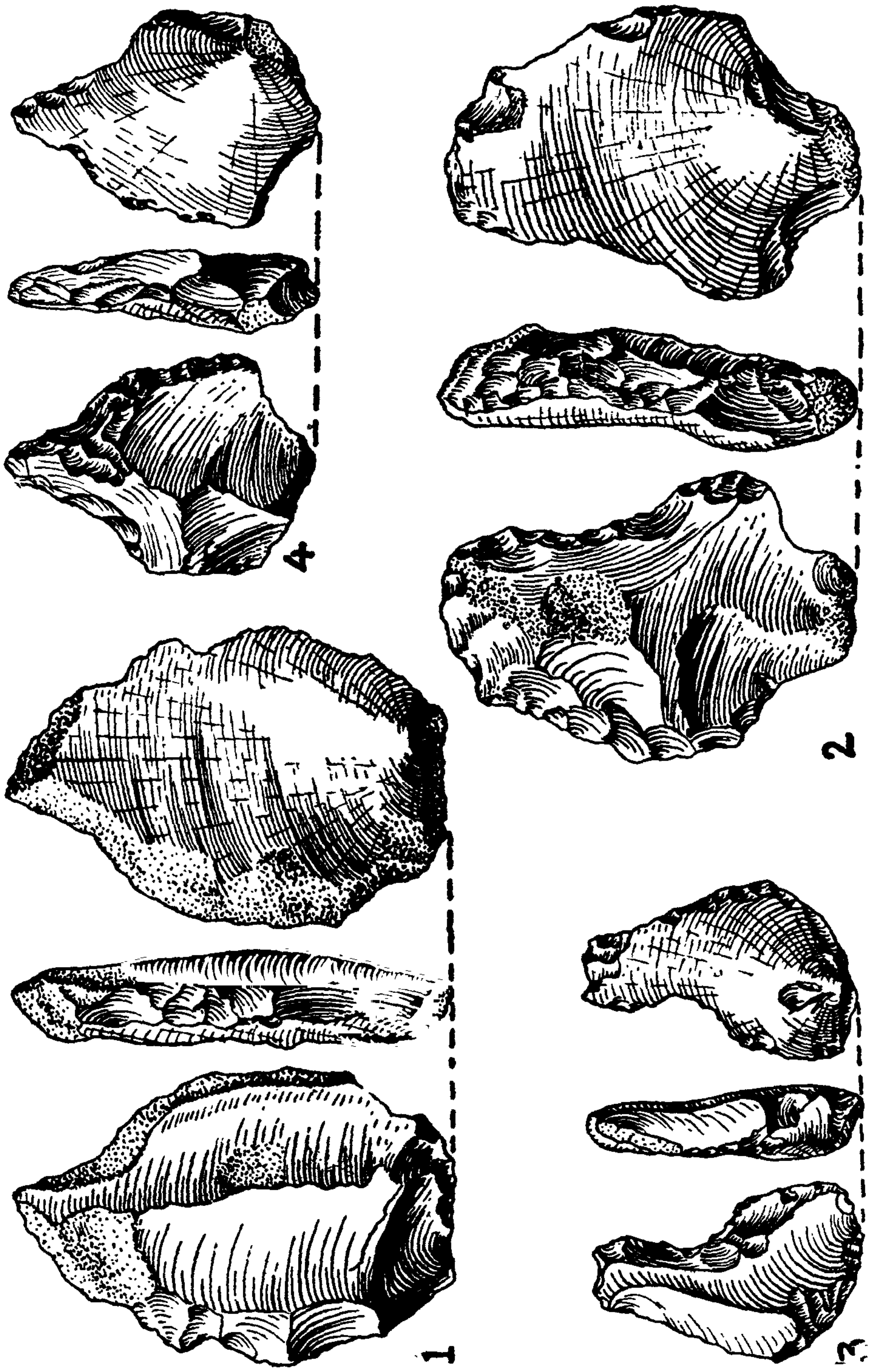


Fig. 41. Points, Borers and Scrapers, Karnatak (1/1).

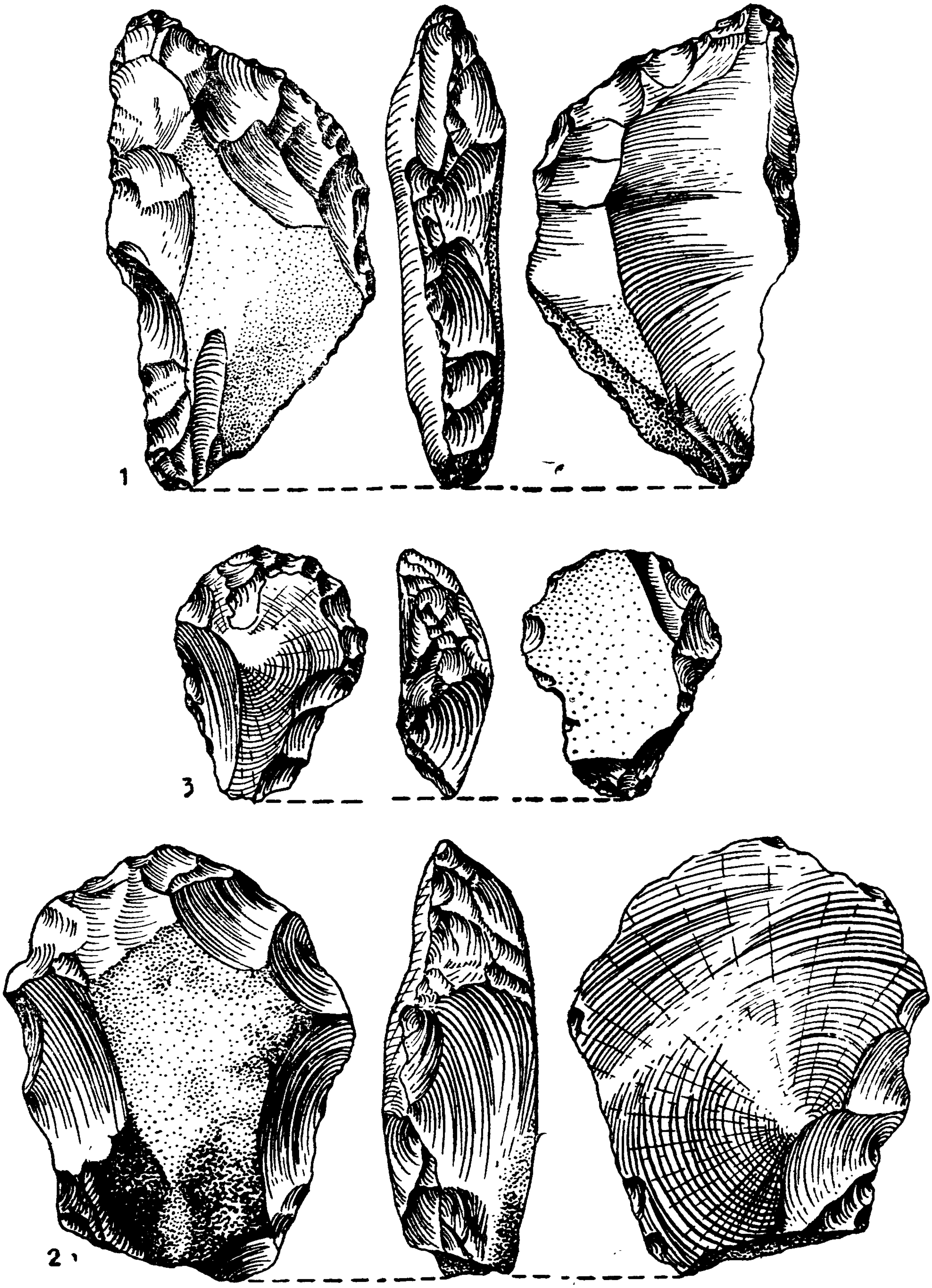


Fig. 42. Scrapers, Karnatak (1/1).

sub-types and some showing incipient or ill-developed tang, scrapers, borers, borer-cum-scrapers, flakes and cores. The borer or borer-cum-scraper is once again the most prominent tool in the industry.

Percentage

Of the total collection, regular tool types form 24·1% and fall into three groups :

I	Points	... ...	12·7%
II	Scrapers	... ...	39·1%
III	Borers	... ...	47·8%

The following tools are illustrated (*Fig. 41*).

Points

(1) Point-cum-Scraper : on a naturally pointed, ovalish, leaf-like flake which by slight retouch on one side and at the butt-end to facilitate hafting, has been converted into a tool. Since one side is thick, it is possible that it was a scraper. Note the cortex formation on the sides near the tip. No. 159, AM, chert.

(2) Tanged Point-cum-Scraper[28] on an ovalish end-flake which has been retouched along the edges to form a scraping edge and a blunt rounded point made by making a small notch on the other side. This along with another on the butt-end has produced a small tang. The tang will facilitate hafting, but does not anticipate a socket, for which it is too irregular. No. 359, GP, chert.

End Scrapers (*Fig. 42*)

The industry includes a large number of scrapers, but among these, this variety is the finest and better than any in Maharashtra. BANERJEE found one scraper in association with a hand-axe in the lower gravel at Taminhal. He further thinks that these are genetically related to the Hand-axe Industry.[29] Another remarkable feature is the sub-groups within the main formed by the types of edge or general shape, and the attempt to provide a tang.

(1) Large end-scraper on an end-flake with flat platform on a broad butt; fan-shaped convex edge, irregular, steep, retouch; two large flakes removed from either side, probably with a view to hafting. OB-1,[30] Chert.

(2) Ovalish end-scraper on an indeterminate flake ; rolled. Roughly convex edge, steeply retouhed, the butt-end probably intentionally narrowed by irregular flaking to facilitate hafting. Found *in situ* with hand-axe gravel I at Taminhal. No. 1, TH, chert.

Hollow Scraper (*Fig. 41, 3*)

(3) Made on a crescentic end-flake with a broader base, with fine bulb and narrow end. The concave edge achieved by steep flake, and later carefully retouched. No. 29,[31] BGKT, chert.

Round Scraper (*Fig. 42, 3*)

Roughly squarish flake retouched along the margin from the upper surface only. These are at some places very steep. BGKT-187, chert.[32]

28. BANERJEE, *op. cit.*, p. 288, pl. 6, i. It is called simply " a tanged point ".
29. BANERJEE, *op. cit.*, p. 234.
30. *Ibid.*, p. 236, pl. 10, c.
31. *Ibid.*, pl. 13. d.
32. *Ibid.*, p. 241, pl. 13, b. Not illustrated here.

Borers

This forms, in Karnatak, numerically the largest group. Though anything—cores, nodules and flakes—is utilized for the purpose, nearly 90% of the borers are on flakes. But here again such pointed flakes were chosen, which lent themselves with minimum retouch for turning them into borers.

(*1*) *Borer with little retouch*

A leaf-shaped end-flake, retouched partly from the upper and partly from the lower to form a slightly protruding borer point. BGKT -365.[33]

(*2*) *Borer with elaborate retouch*

This is a more advanced group in which the guards ar made as in the intermediate state.[34] but the point is well projected and very carefully prepared.

(*3*) *Borer on Core*

A small unfinished borer on an oblong core. Partly retouched, but the point is still thick and hence probably incomplete. No. 326. BGKT.[35]

Of all these four sub-types, only one is here illustrated. (*Fig. 41,4*)

Borer on an elongated heart-shaped end flake. On the upper surface, the borer point is symmetrically brought out by hollowing its sides and careful retouch, whereas as butt end has been flattened to facilitate hafting. No. 105, AM, chert.

Kurnool

In Kurnool (Andhra), CAMMIADE and BURKITT had already classified typologically their collection into Series I, II, III, the first corresponding to our Early Palaeolithic.

Stratigraphy

Later, as mentioned above, ISAAC has covered a much wider field and collected extensively. The position of his Series II tools seems to be well indicated, though nowhere the tools occur in a cemented gravel as at Bel Pandhari and other sites on the Godavari or Maheshwar on the Narmada. At a number of sites these tools are mixed up with the later or earlier deposits, and since very often the same raw material viz. quartzite[36] is used for both the types of tools, it is difficult to differentiate, particularly those which are merely flakes. Hence the tools are not yet statistically treated, though arranged after BURKITT into four series. Both his Series II and III comprise tools which would be elsewhere called " Middle Palaeolithic " or simply Series II. Pending further clarification, a few important types are here illustrated. It should be pointed out that the collection includes all the main types which characterize the Nevasian, including the tanged variety of points, borers and scrapers. Another interesting feature is the size. On the whole, the tools are larger than those from Maharashtra or we may say larger than those from the basalt region. (*Fig. 43*)

33. BANERJEE, *op. cit.*, p. 246, pl. 16, a.
34. Here omitted.
35. *Ibid.*, p. 255, pl. 17, a.
36. This is particularly so in the Nallamalai region. In the Erramalai jasper and other fine grained material was preferred during the Middle Palaeolithic times.

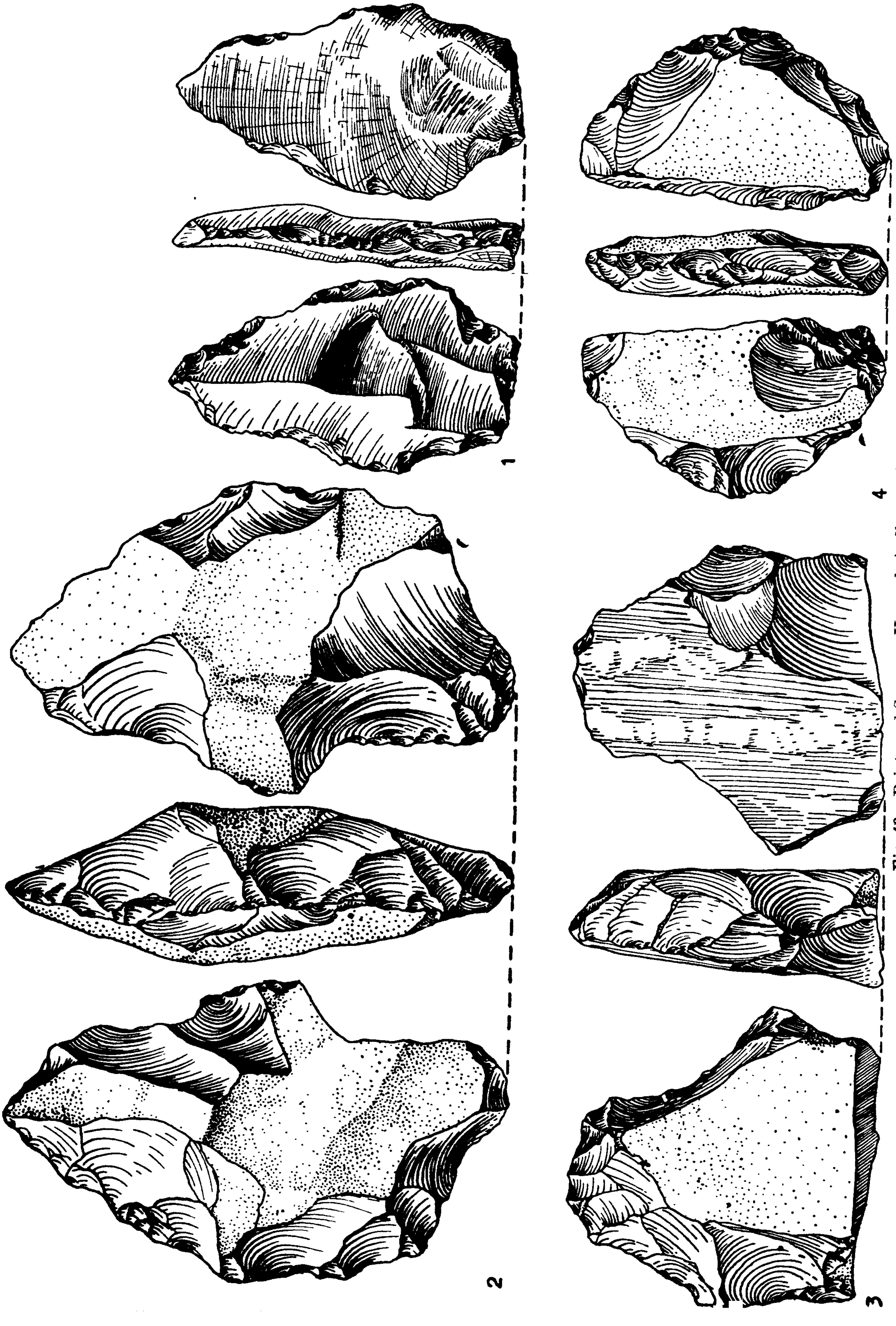


Fig. 43. Points and Scrapers, Kurnool, Andhra (1/1).

1. Point,[37] leaf-shaped, on a large plano-convex flake, angle 90°, cortex on platform, erased bulb. A flake removed from the butt-end on the top. The margin near the working end trimmed. Included in Series III by ISAAC. VP, 224, quartzite.
2. Point,[38] bifacial and tanged, on a large flake. Beautifully worked on both faces by deep and shallow flake scars. Tang made by deep flaking on the underside. VP. 48, quartzite.
3. Scraper,[39] Side-and Hollow, on a thick, irregular flake. It can be described as an End-Scraper as well. BGM, II, 45, cherty quartzite,
4. Scraper,[40] on a semi-circular flat flake, the margin of the semi-circular edge worked from both faces by bold retouch. PCF, II, 131, limestone.

In other districts of Andhra no survey has been carried out, nor in the States of Madras and Mysore (barring Northern Karnatak). Thus the further southward distribution of this culture is at present unknown, but it can be confidentially asserted that it will be found. And it is this industry which later developed into the Teri microlithic industry.[40a]

Orissa (*See Fig. 44*)

Stratified deposits exist on the Khadkai at Bijatala and Kandalia, District Mayurbhanj, at Ramla and Jagannathpur on the Baitarni in District Keonjhar, at Jhirapani on the river Koel, at Khurhadi on the Khurhadi (a tributary of the Brahmani) in the Sundargarh District, whereas at Harichandanpur in the Dhenkanal District there is a factory site as there are outcrops of quartz, jasper and quartzite.

Stratigraphy

The stratigraphy in general is (beginning from the bottom) rock or at times clay, coarse gravel, reddish silt, fine gravel, red silt, though at places the basal gravel might be missing or under water. The basal or the first gravel is coarser, whereas the second is finer. It is this which yields Middle Palaeolithic tools, while the basal gives tools of the Hand-axe complex. However, it must be mentioned that such a section is rare. At Bijatala, Jhirapani and Kandalia, the lowest coarse gravel is missing. Only at Ramla, Bhaliatundi and Tumkelaghat, the coarse gravel is capped by fine gravel and red silt; the latter again is capped by a thick deposit of silt.

Tool Percentage

So far some 400 specimens have been collected.[41] Of these about 73% are flakes, and 13% each cores and nodules. Actual tools form about 52·00%. These fall into the following groups :

I	Scrapers	71% (151)
II	Scraper-Borers	2% (5)
III	Points	21% (46)
IV	Borers	1·9% (4)
V	Burins	1·9% (4)

37. ISAAC, *op. cit.*, p. 521, LXIII, 219.
38. *Ibid.*, p. 513, p. LXXII, 192.
39. *Ibid.*, p. 525, pl. LXXIV, 233.
40. *Ibid.*, p. 513, pl. LXXIV, 249.
40a. The late Prof. SUBBARAO had discovered such tools in terrace 3 at Attirampakkam near Madras. The writer had an occasion to see these at Baroda in May, 1962.
41. MOHAPATRA, *op.cit.*, pp. 197-98.

Tool charactar

Since the flakes predominate in the collections, the industry should normally be called a "Flake Industry." But it has to be emphasised that the flake was not an essential prerequisite in the technique. The majority of the flakes have been removed by soft cylinder hammer. Hence the bulb is diffused. The angle between the striking platform and the flake surface is wide. Prepared platform flakes are few. Thus the true Levalloisian element—preparation of the core and the flake prior to removal—is absent.

As far as the actual preparation of the tool is concerned, secondary retouch is employed. But it is marginal, and generally confined to the upper surface and that too only at most essential places. Only a few tools exhibit retouch from both the surfaces.

Burins

Before illustrating a few representative specimens, a word about the burin is necessary. Though MOHAPATRA has included it among the main tool types, none have been found *in situ*.[42] They occur exactly as at Nevasa, Poona and elsewhere in Maharashtra along with other tools on the surface. Their stratigraphical position is not yet determined. Since they do not form a part of the microlithic, it is possible that these form a part of a culture following the Middle Palaeolithic and preceding the Microlithic, because of the technique and the typological similarities to the Upper Palaeolithic.

Illustrated types (Fig. 44)

1. BORER ON CORE, greenish banded opal, under surface has cortex. Borer tip made by making a notch at a side and further trimming. BDR-44[43]
2. Point, leaf-shaped, bluish shale, upper surface has cortex, whereas the under surface has centrally converging flat flake scars; with its symmetrical body it is one of the "best finished" points. BTL-15.[44] (*In situ*).
3. BORER OR POINT on roughly triangular flake, clean under surface, upper surface flaked. Neatly made triangular point. RRP-14.[45]
4. POINT, triangular flake on milky quartz, edges and tip retouched from upper surface, which has a very regular and parallel sided flake scar, suggesting the removal of a blade flake, Tip thin and sharp. BSI-4[46] (*In situ*).
5. BURIN on side flake, fine grained bluish translucent quartzite, triangular gouze type. Bahalada-2.[47]
6. SIDE SCRAPER on thick flake, cortex on surface, retouched on one side. RRP-41, black chert.[48]
7. HOLLOW SCRAPER, roughly triangular, bulb and platform removed. Minutely retouched on three sides, more prominently on the broader side. RRP-15,[49] honey-coloured jasper.
8. HOLLOW SCRAPER on irregular nodule. Deeply notched hollow. *In situ*. JPNI-1, red jasper.[50]

42. As shown elsewhere, this seems to belong to the real Mesolithic period.
43. MOHAPATRA, *op.cit.*, p. 240, pl. XLII, 6.
44. *Ibid.*, p. 227, pl. XXXVIII, 2.
45. *Ibid.*, p. 241, pl. XLII, 8.
46. *Ibid.*, p. 226, pl. XXXVII, 2.
47. *Ibid.*, pp. 242-44, pl. XLII, 1.
48. *Ibid.*, p. 200, pl. XXXI.
49. *Ibid.*, p. 205, pl. XXXII, 3.
50. *Ibid.*, p. pl. XLVI, 5.

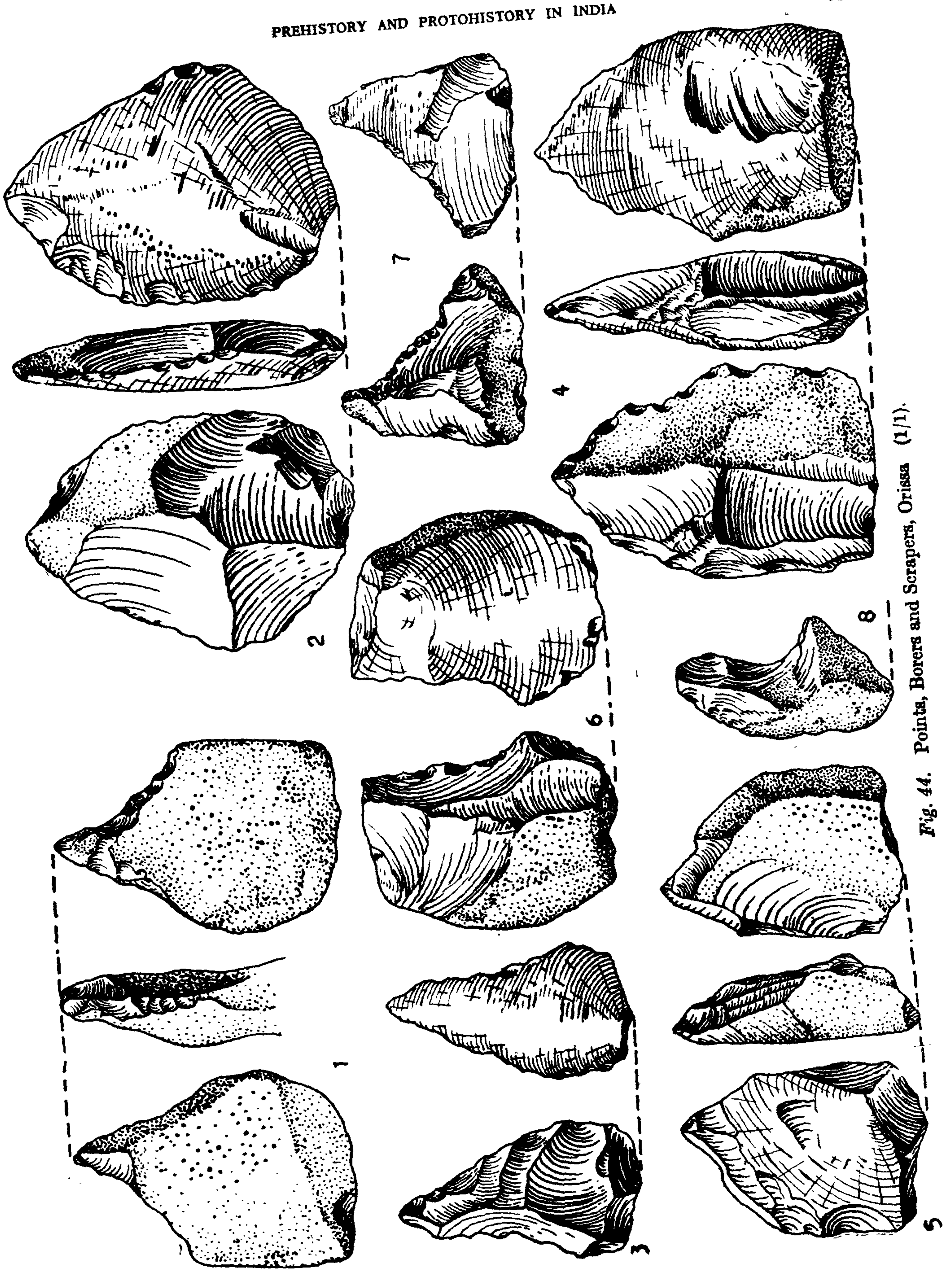


Fig. 44. Points, Borers and Scrapers, Orissa (1/1).

West Bengal

Though there is a reference to Series II in the assemblages from the Kasai Valley in the District of Purulia. now in West Bengal those tools which were exhibited at Baroda in 1960 appear to belong more to the microlithic tradition than to Series II. Hence in the absence of clear data, this area may just now be excluded from the distribution map of the Middle Palaeolithic. However, there is no reason why this Stone Age culture should not flourish in the Kasai Valley, for it is but a part and parcel geographically and climatically of Chota Nagpur.

No tools of this nature have so far been reported from the Singarauli Basin in Mirzapur district.

Malwa

In Malwa, so far two stratified sites are from the Shivna Valley[51] viz. Mandasor and Nahargadh. Here the second gravels have yielded 7 tools, but a large collection—over 200—has been collected from several sites on the surface. Whereas at Khadki Mata, a site about three miles away from Ramghat on the same river near Mandasor, there are beautiful outcrops of yellowish red jasper, and hundreds of flakes and chips are scattered around them, indicating that this was a workshop.

Khatri thought, from the nature of his collection, that this was mainly a flake industry in which the flakes exhibited simple platforms with obtuse striking angles. No Levallois influence was observed by him.

Typologically, however, the small Malwa collection has preponderance of scrapers and points[52]—125 out of 200.

The *in situ* material consists of side-scrapers, borer, point-cum-scraper and flakes.[53]

Illustrated Types (Fig. 45)

1. Convex-edged scraper, retouched from the underside of the flake. No. 246, MDR, ferruginous sandstone.
2. Three-sided scraper on a thick oval end flake. Steep, bold, retouch from the underside up. No. 16, MDR, jaspter.
3. Discoid scraper, evidently on a core. No. 76, MDR, veined quartz.

Rajputana

Varied physiographical aspects in Rajputana (p. 36) seem to have influenced the cultural development in Palaeolithic times. Though how far this is due to the chance of discovery, and how far due to the actual climatic and physical features or causes remains to be determined.

51. From *Stone Age Cultures of Malwa*, by A. P. Khatri, Ph. D. thesis in Archaeology submitted to the Poona University in 1957. Copies in the Deccan College and Poona University. New discoveries are reported in *I.A.R.*, 1959-60, p. 22.

52. From Khatri's final total 321 (p. 168) fluted cores and flakes have been omitted, as these seem to belong to a later culture.

53. *Ibid.*, p. 166, pl. XXXVII, 4, 3.

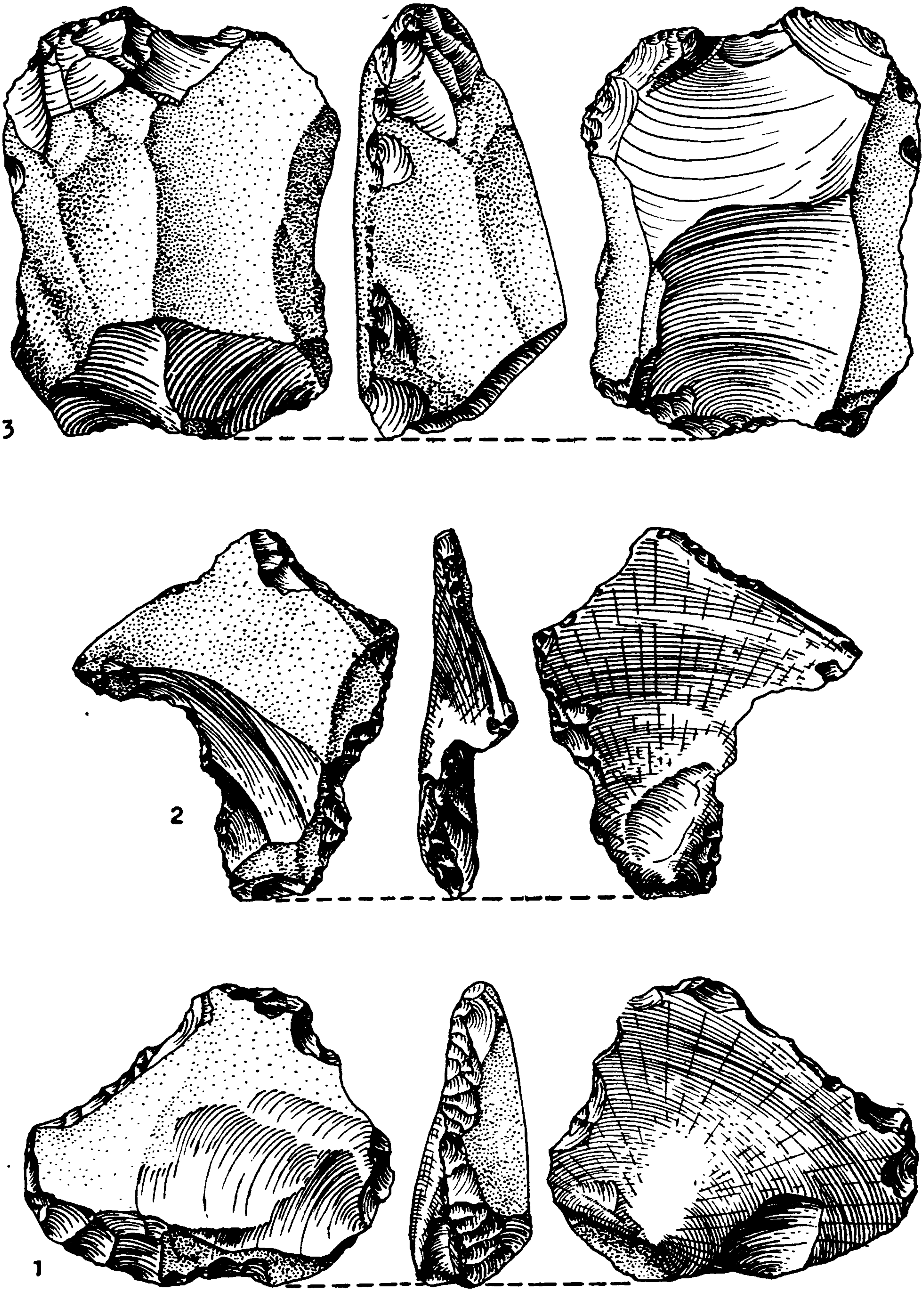


Fig. 45. Scrapers, Malwa, Madhya Pradesh (1/1).

Thus a few traces of Middle Palaeolithic Cultures have been reported from Eastern Rajputana, though it is unbelievable that this should have none; for it is contiguous and in fact part of Malwa. In the latter, particularly from the Chambal and its tributaries, the Shivna, KHATRI and the writer collected scraper-points. Nor is good raw material—flinty chert—absent from Eastern Rajputana. Near Chitor,[54] there is limestone and the hill slopes were later the knappery of microlithic people. Further search should in future yield tools of this culture.

Luni Valley

Some knowledge of the culture in Western Rajputana, we owe to MISRA.[55] So far he has surveyed the Luni and its tributaries—Jojri, Reria, Bandi, Sukri, Lilri—at convenient points. The Luni alone seems to be important, for at some eight sites on it—Samdari (SMD), Dundara (DDR), Luni (LNI), Srikrishnapura (SKP), Golio (GLO), Hundgaon (HDG), Bhawi (BHW) and Pichak (PCK)—tools have been discovered.

The region is rich geologically, but much of it is hidden by blown sand and alluvium. While the eastern zone preserves some of the oldest rock formations in the Aravallis—like the granites, quartzites and chists, the Western, on either side of the Luni and around Jodhpur, exhibits later formations—rhyolites (a volcanic rock), sandstones and limestones. The former—quartizite—has been principally used by Early Man in Eastern Rajputana. In the latter, his successor had to fall back upon occasionally on the high acidic rhyolites, but largely on the cherts and flints which form in the cavities of limestone.

Past Climate

Though most of the tools have been collected from the river bed, the few *in situ* specimens and the factory sites indicate that the tools were made when the climate was much wetter than today. Only then the rivers in this part of Rajputana, which is mostly arid, could have carried gravels, which are—wherever observed—very well cemented. They lie on a basal bed of white clay, a disintegration of sandstone or (limestone ?) and overlaid by sandy silt and huge deposits of windborne sand. The gravel is never more than 5 feet in thickness and contains small pebbles of crystalline rock as well as nodules of chert, flint etc. It is the latter which have formed the principal raw material for Palaeolithic man.

Stratigraphy

The gravels are covered by a fairly thick deposit of brownish silt which is sandy in the upper horizon. Its thickness varies from 2 feet to 10 feet. While this feature is seen in other regions as well, it is so pronounced in Western Rajputana that one can definitely say that it is this sandy phase which heralded the extreme aridity following a gradual dryness and decreasing rainfall. Fast moving sand dunes, tuffas and salt pans which form the topography of the region, were the result.

54. Here a couple of flakes were picked up by us in the Gambhiri in March 1961. *I.A.R.*, 1960-61, p. 31.

55. MISRA, V. N. "Palaeolithic Culture of Western Rajputana" in *BDCRI*, Vol. 21 and Ph.D. thesis in Archaeology, Poona University and Deccan College Libraries, 1961.

Thus the Palaeolithic culture definitely belongs to a past wet period in Western Rajputana. This on typological ground, as well as on the nature of gravel and silt is comparable to the second aggradational phase and the associated arefacts. MISRA has simply called it "Palaeolithic," but has nevertheless drawn our attention to the close affinity it bears to the Middle Palaeolithic Cultures of the Deccan, Central India, Orissa and Andhra-Karnatak.

Raw Material

However, there are some differences. Though the dominant material is chert, it is so fine grained and of varied hues—white, grey, black, dark brown—that it resembles real flint, which is also present in a small quantity. In addition, there is silicified wood, sandstone, hardened slate, and rarely quartzite and rhyolite. Thus the raw material is certainly of a distinctively varied nature, and this has had some influence on the resultant tools. As elsewhere, suitable nodules have been converted into tools, but flint, fossil wood, and chert nodules are often in a state which cannot be readily used. These had to be flaked (broken intentionally), and hence the proportion of such flakes is higher than elsewhere. Three or four methods—anvil, punch, soft cylinder hammer and prepared core—have been followed, as is evident from a study of the cores and flakes. Particularly, striking is the last of which we have fine specimens of "tortoise core" and Levallois flakes.

Tool Types

The tool types include : (1) Hand-axes or bifaces of various types, (2) Cleavers, (3) Scrapers of various types, (4) Borers, (5) Scraper-borers, (6) Points—Unifacial and Bifacial, (7) Flake Knives and (8) Flakes.

Hand-axes (Fig. 47)

Since the number of hand-axes is small and their distribution limited in the Luni Basin, MISRA thinks that they belong to the Eastern Rajputana Stone Age complex rather than to the Western. Though this is probable, his Group B contains highly advanced Acheulian types. Made on thinnish flakes, with lenticular or plano-convex section, worked all over by shallow flaking, symmetrical in outline with a slightly wavy edge and above all small, they recall a similar form in Malwa, Gujarat, Central India(East), Mirzapur, Orissa, Andhra, Karnatak and Maharashtra. In the last four regions and in the adjoining Malwa (Mandasor) these small hand-axes and cleavers seem to belong to a transitional stage between the Early and Middle Palaeolithic or to the last stage of the former.

Two of the hand-axes are here illustrated.

(1) Pointed Ovate[56] on a thick flake. Beautifully worked all over on both the surfaces by "step" and soft hammer technique. It is almost plano-convex in section, underside nearly flat, and the upper rounded. No. 55, LNI, brownish chert.

(2) Pear-shaped hand-axe,[57] fully worked on both the faces by step technique. Bears patches of thick encrustation. Quite fresh in mint condition. No. 123, DNR, grey chert.

56. MISRA, *op. cit.*, p. 167.
57. *Ibid.*

Cleavers (Fig. 47)

This group is again small, but fully representative with "U," narrow or broad butt, and straight, oblique and splayed edge. Out of seven, six are made on flakes (one actually on a Levallois one), by an advanced technique. This is also the case at Gangapur, near Nasik, where the industry seems to be late Acheulian in character.

Thus these groups of hand-axes and cleavers seem to be quite significant in the Palaeolithic history of Western Rajputana.

(3) Cleaver[58] on a side-flake, with pointed butt, and broad straight sharp edge, parallelogrammatic section. From the upper surface a large flake has been removed as in Vaal technique, whereas the thick side has not been flaked. No. 83, LNI, pinkish rhyolite.

Tortoise Core (Fig. 47)

The collection includes a number of fine tools on Levallois flakes, and fortunately also a large Levallois core.

(4) A large "tortoise" core[59] from which one large triangular flake with a convex butt-end has been removed from one surface. Two flakes have also been detached from the undersurface of which one is of Levallois type. No. 1, HDG, flint, patinated.

Flake Knives (Fig. 47)

These seem to form a distinct category from side scrapers. Though there is a cutting edge along one side of the edge, and a thick hand-hold on the side opposite it, the edges are not made by retouch. In (*i*) the edge along the longer axis is perpendicular to the bulbar end, whereas in (*ii*) the transverse cutting edge is along the shorter axis, opposite the bulbar end.

A specimen of each group is illustrated.

(5) A knife[60] on a thick rectangular flake, clean undersurface with untrimmed platform, as also the thick longer side. The edge of the longer sloping side marked by use. No. 227, LNI, dark yellow patinated flint.

(6) A knife[61] on a thick flake, smaller than No. 227. No. 228, LNI, mottled chert.

Borers (Fig. 46)

These, as elsewhere, are prepared on thick flakes by one or two notches on either side of the tip or point.

(1) Borer[62] on a large Levallois-like, triangular end flake, having erased bulb and a platform with one made facet, angle almost 90°; upper surface almost flat. Borer tip made by a bold rather careless retouch along two sides. The tip is thick and looks unfinished. No. 111, DNR, white chert, patinated yellow.

Borer-Scrapers (Fig. 46)

This is a characteristic tool of this culture. And it is interesting to note that a tool almost identical in nature, but on a much larger flake, has been

58. *Ibid.*, p. 170.
59. *Ibid.*, p. 200, pl. XXXVII, a. b.
60. MISRA, *op.cit.*, p. 190, pl. XXXIII, 3a.
61. *Ibid.*, pl. XXXIII, 3b.
62. *Ibid.*, p. 182, pl. XXXIV, 1.

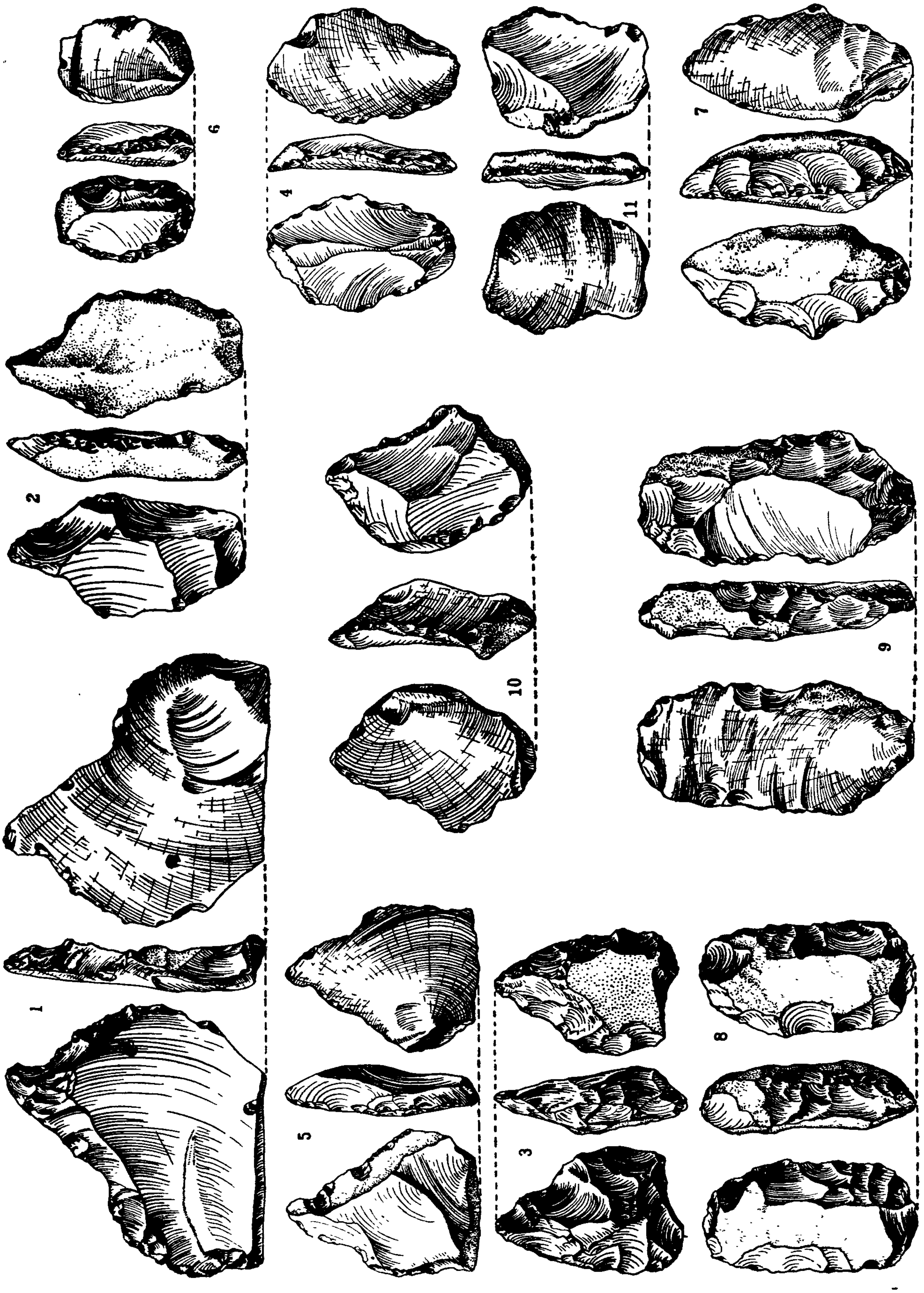


Fig. 46. Points, Borers-and-Scrapers, Rajasthan (1/2).

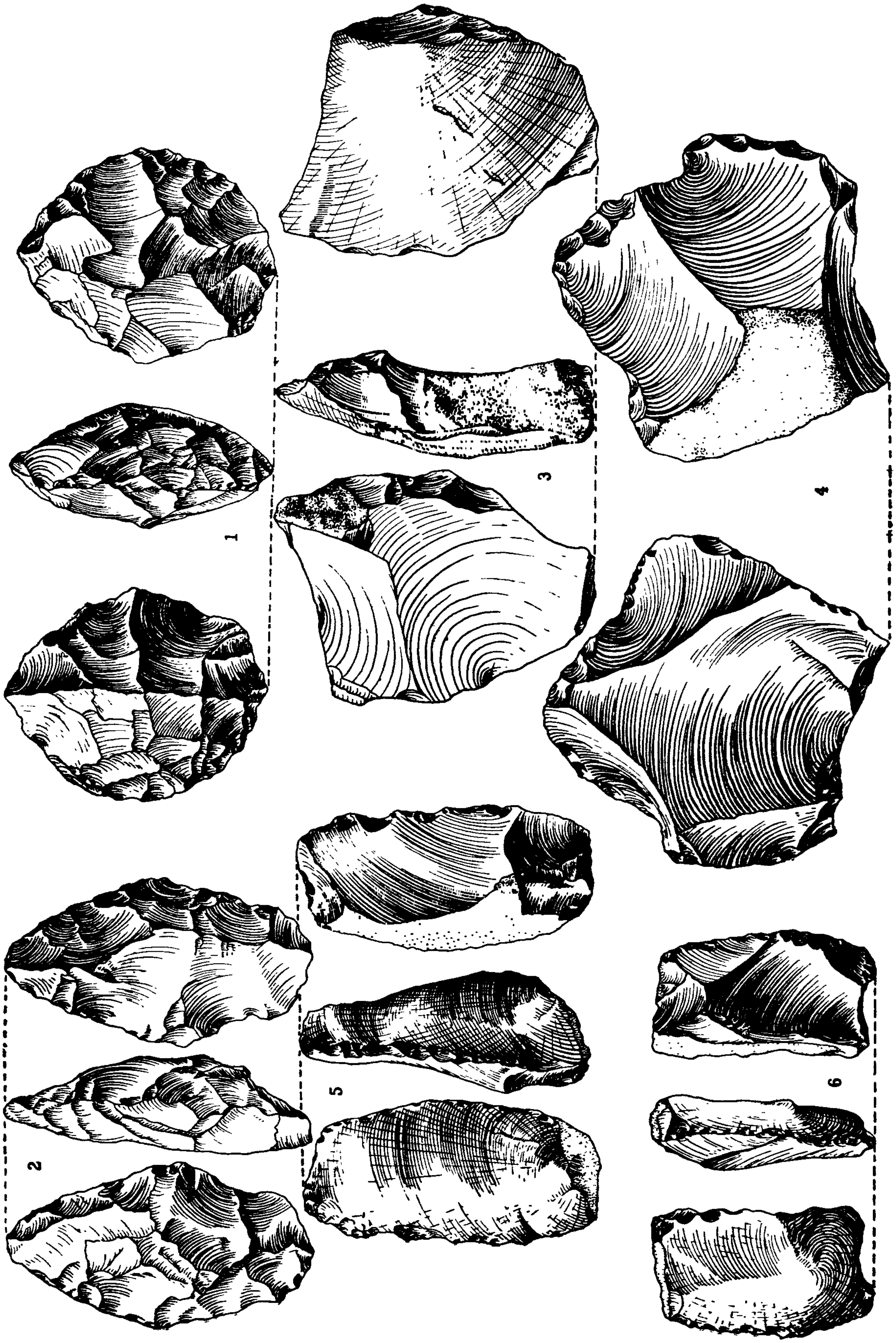


Fig. 47. Small hand-axes, Cleaver, Flake-Knives and Tortoise Core, Rajputana. (½)

recorded from Eastern Rajputana and from Maheshwar on the Narmada in Central India.

(2) Borer-Scraper[63] on a large sub-tringular flake. The borer point is achieved by removing a deep flake from either side of the point, *but* once from the top surface, and then from the under surface. Thus a narrow projecting point has resulted. To get effective scraping edges, the upper sides are marginally retouched, and deep flakes are detached from the under surface. Then to facilitate hafting, one more flake is removed from the bottom and the rear of the butt end. Very fine tool. No. 38, SNG, black basic lava.

Points (Fig. 46)

Unlike other regions, Western Rajputana has two kinds of points : (*i*) Unifacial, (*ii*) Bifacial.

Unifacial Points

This group includes types which are, (*a*) Carefully prepared, unretouched flakes, (*b*) partly or fully retouched on both sides. Further divisions may be made according to the size and thickness of specimens.

Characteristic types of each group and sub-groups are illustrated.

Bifacial Points

The finished specimens are thin, and seem to be made on flakes by careful, soft cylinder hammer technique. Without median ridge, bilaterally symmetrical, they seem to be miniature hand-axes. Though comparatively few, these tools constitute a new feature of the industry, not so far observed elsewhere except in Kurnool.[64] Those from the *teris* of South India are pressure flaked and truly microlithic in character.

(3) Bifacial Point[65] on a thick triangular flake. The top of upperside retains cortex, but the sides are carefully trimmed by step-technique. The undersurface is fully flaked similarly and the scars seem to meet near the thick butt. No. 110, LNI, grey chert.

(4) Point[66] on a thin leaf-like Levallois-type flake, without, however, any real platform. No sharp point, and the sides seem to be indented by use. No. 113, LNI, yellowish flint.

(5) Point[67] on a triagular flake, plain platform with cortex, diffused bulb, 110° angle. Both margins completely retouched from the upper surface. No. 1, DDR, brownish chert.

Scrapers (Fig. 46)

They fall into two groups :

(*i*) Srapers with sharp cutting edge along one side or at the end of the flake or pebble, and a thick back or side opposite the edge for hand-hold. The edge is made by rather largish flake scars.

(*ii*) Scrapers, smaller and lighter, mostly made on flakes, but of Levallois type few. Specimens with cortex on one side or even chunk or pebble used. Retouch marginal and fine and some at least by pressure technique.

63. *Ibid.*, p. 182, pl. XLI, 2.
64. See, Isaac, *op. cit.*, pl. LXX, fig. 166-7.
65. Misra, *op. cit*, 188, pl. XLV, p. 5.
66. *Ibid.*, p. 198, pl. XXXV, 2.
67. *Ibid.*, p. 186, pl. XIV, 5.

There is a cruder sub-group made on pebbles or chunks and marked by an indeterminable retouch.

As elsewhere, this Group includes (*a*) Side Scrapers, (*b*) End Scrapers, (*c*) Hollow Scrapers and (*d*) Round Scrapers.

A few specimens of each variety are illustrated. (*Fig. 46*)

Side Scraper

(6) Side Scraper[68] on an ovalish flake having flat undersurface, and traces of lime encrustation, bulb not distinct. The convex side on the upper surface is carefully retouched to give a scraper edge. No. 14, SKP, *in situ*, greenish chert.

(7) Side Scraper[69] on a thick pointed ovoid flake, underside has a fine narrow bulb and wide-angled platform. On the upper surface, one side retains the cortex, whereas the other longer side has four steep scalloped scars, and the edge bears traces of use, flint.

Two-edged Scraper

(8) A very thick perfectly ovoid or oval piece[70] with its central flat surface unflaked on both the sides, but the margins are trimmed by alternate flaking to give a sharp wavy edge. No. 148, LNI, blackish lava rock.

(9) Scraper[71] on a large sub-triangular flake of Levallois-type, though platform unfaceted. Both the longer sides have wavy, partly retouched edge. No. 230, LNI, greenish agate.

Bundelkhand

Data of very important and far-reaching significance have been recently collected by Shri RAMESHWAR SINGH of the Deccan College. Extending the investigations to Northern Bundelkhand from Malwa where Dr. KHATRI had left, Shri SINGH has discovered a number of sites on the Dhasan. This is a tributary of the Betwa. Here at Sihora, Ghatsemtra, Hasrai, Mohasa, all in Sagar District of Madhya Pradesh, occur stone tools of fine flint, japser and quartzite. These include hand-axes and cleavers on side- and end-flakes as well as slightly smaller tools like points, scrapers and borers. Unfortunately no stratified section is available. But from the nature of the evidence, very shallow banks and freshness of tools, it appears that the makers of both the tool types were staying near the source of the raw material. Hence both the types of tools are found together. And hence it is possible to understand the transition from the earlier to the later culture. There are a number of small hand-axes and cleavers on prepared cores, but often without prepared platform and the tools of the Middle Palaeolithic character are also made on such flakes.

Special Features

The character of the latter is proved independently when they occur unassociated with earlier material in a stratified context at Gonchi on the river Betwa in Guna District. Here the tools are fashioned out of jaspery flint. The detailed statistics are not yet worked out. But two or three things are remarkable. One has already been noted viz. the frequency of tools on prepared flakes.

68. *Ibid.*, p. 176, pl. XLIII, 3.
69. *Ibid*, p. 72, pl. XLII, 8.
70. *Ibid.*, p. 179, pl. XL, 3.
71. *Ibid.*, p. 193, pl. XLIV. It is included under " blades ".

The second is their size. On the whole the tools are much larger in size than those seen from the Deccan. This feature is shared with Western Rajputana and Karnool. In fact one may say that wherever good raw material was available, fairly large points, borers, scrapers were made on flakes, blades or any flat piece.

A few typical tools are illustrated.

FIG. 48

1. Large point or a lance-head made of a fine flake, having unfaceted platform, diffused bulb. The upper surface has mostly cortex, except one longitudinal flake scar, on the top and minute one near the point. The margins of the flake seem to be battered recently. Flint patinated dark brown. 1. GHNI *in situ*.
2. A longish flake having a tongue-like projection with both its lateral sides steeply retouched. One of these sides has a slight projection, which is also worked, thus making it a borer-on-side. Thus this specimen could be described as a borer-cum-side-and-end-scraper. Flint patinated dark brown. SRA.
3. Borer on a heart-shaped side-flake. The bulb is prominent and the platform unfaceted and angle very wide. The point marked by bold, steep retouch. Material same as above. SRA.
4. A beautiful borer on a roundish, disc-like side flake. Both the surfaces of the flake seem to have been carefully worked by pressure-flaking. The borer point is effected by a deep notch on one side and by a shallow scar on the other. Chalcedony. GMHI. 8.

FIG. 49

1. Borer-cum-Scraper on a heart-shaped flake, finely faceted platform, steep retouch.
2. Borer-cum-Scraper on a small flake, with steep retouch.
3. Hollow or concave scraper on a flake, unfaceted butt, bulb erased. Deep concavity intentional, and its margin minutely retouehed.
4. Side-and end-scraper on a flake having unfaceted platform and prominent bulb. Margins steeply and boldly trimmed. Flint patinated dark brown. HSRI.
5. Levallois-like core, two flakes have been removed from surface, the sides are prepared, and one of the shorter edges possibly retouched to make it a scraper. Material as above. SRA.

Dr. R. V. JOSHI carried out a brief survey of Damoh district, besides Bhilsa and Sagar.[72] In the valleys of the Sonar, Kopra and Bearma, a number of sites with Series II were found. These include flakes and blades, but none removed from fluted cores, scrapers, points, borers and core-choppers.

Other Sites

Further northwards, on the north-easternmost extension of the Vindhya hills, Bridget ALLCHIN[73] describes some four sites, Pandav Falls, Baghain River gravels, Kanhari Fields, and Rehuntiya. The last is in Banda district and is probably the most north-easterly point in the distribution of the Middle Palaeolithic Industries. The most important sites are however the first two, Pandav Falls being a factory site. The tools from the latter—whether made of limestone or fine quartzite—have undergone a peculiar weathering. The tools have a

72. *I.A.R.*, 1958-95, p. 26, and 1960-61, p. 62. A full report has been published in *A.I.*, No. 17 (1961), p. 5 ff. The most important sites are Khojakheri on the Kopra and at Rehli on the Sonar.

73. *Op.cit.*, p. 15.

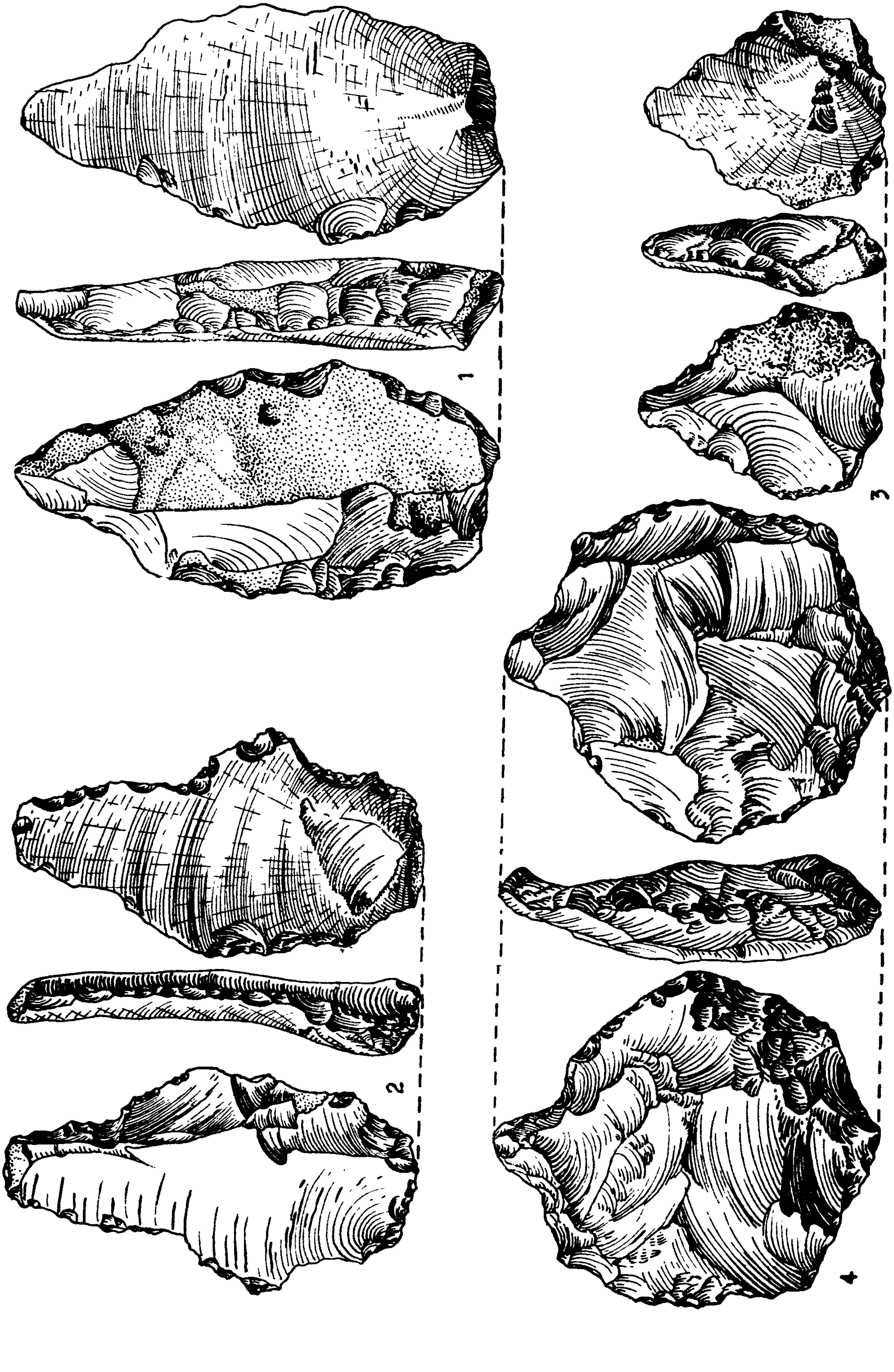


Fig. 48. Points and Borers, Bundelkhand (1/1).

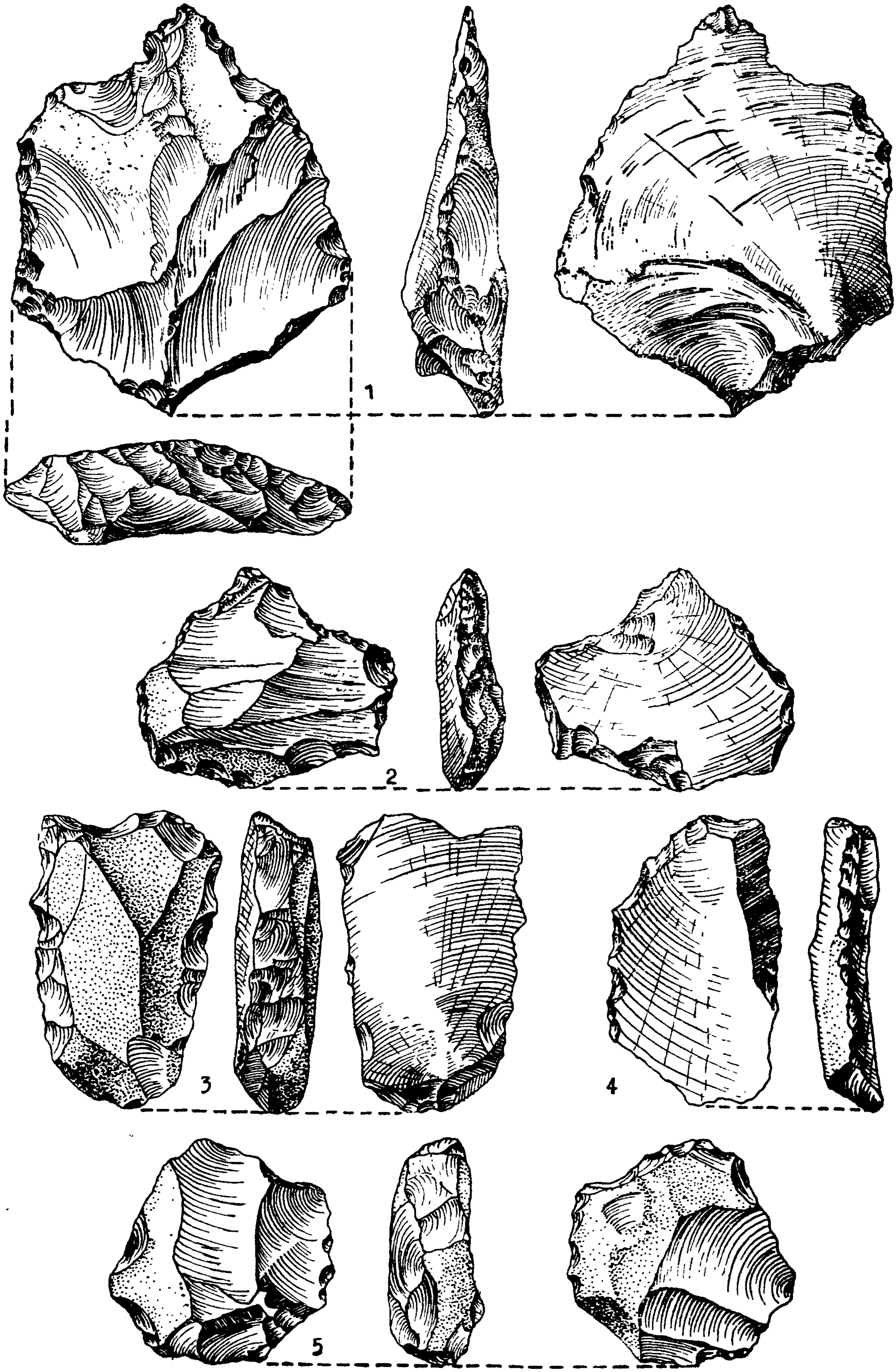


Fig. 49. **Points and Scrapers, Bundelkhand (1/1).**

matt surface, instead of glossy, and have become porous like pumice. The collection includes (*i*) Several types of scrapers, (*ii*) Points, (*iii*) Cores including the "tortoise" type, (*iv*) Flakes, (*v*) Blade flakes, (*vi*) One hand-axe and (*vii*) Chopping tools. While the existence of hand-axe is not very surprising as small ones have been found *in situ* at Nevasa, the recording of "Points" is important, because the author says, elsewhere in the same paper,[74] that well defined points are absent from the Indian Middle Stone Age, which seems to go against our observation.

The collection from the Baghain River gravels is of a similar nature. All the 9 flakes are struck from prepared cores, though none exhibits prepared platform. This is also a feature of SINGH's collection from the Betwa.

Nagpur

Explorations in the districts of Nagpur and Wardha have brought to light Middle Palaeolithic tools. The rivers so far surveyed, partially, are the Wuna and Wardha. On the former, the site near the village Khaira was found with cemented gravel, resting directly on the Deccan trap. It yielded scrapers, points, discoidal cores, tortoise cores and choppers.

Stratigraphy

Many more sites exist at the confluence of these rivers in the Wardha district, of which the most important is Patala. Here the cliff is fairly high over 20 ft. and from bottom to top is made of (1) coarse cemented gravel, (2) 3 ft. of reddish sandy silt, (3) 10 ft. of fine cemented gravel, (4) dark brown silt. Layer (3) of fine gravel contained sidescrapers on thick blades, hollow scrapers, discoid cores, borers, points, some probably tanged.

Upper Palaeolithic (?)

The Kanhan near Nagpur proper has, it is understood, such stratigraphic evidence that it may be possible to postulate an Upper Palaeolithic culture.

Bombay Area

A reference was made above to the tools discovered by TODD at Kandivli and other sites in what is now called "Greater Bombay," and it was said that the writer's subsequent work at Kandivli gave a different picture. The background of this new study and the results are given below in detail. (*See Fig. 50*)

The Western Coast, including Bombay, consists of a series of islands, creeks, lagoons and bays, which bestow a picturesque appearance to the whole topography of the region. It is not all a flat marshy land as Calcutta on the east coast.

While the sandy beaches and the slightly inland marshes are comparatively young, formed as they are in sub-recent times, the case of the entire coast is much older. All this again is basaltic,[76] formed by the lava flows during the

74. *Ibid.*, p. 29.

75. *I.A.R.* 1959-60, p. 32-33.

76. For details see the summary of recent work Souvenir published by the University of Bombay on the occasion of the 47th Session of the Indian Science Congress, Bombay, 1960. Among the various basaltic rocks may be mentioned the top basalt which is fine grained and glassy.

Eocene times. Fossil buried forests from the Bombay harbour suggest that a period had intervened between this lava and the subrecent times when the alluvium was formed.

It is also probable that at one time in the past the coast line was also one continuous piece of land, but was later cut up into islands and creeks, owing to surface erosion and marine transgressions. Hills thus suddenly seem to rise up from the surrounding sandy plains, as at present day, near Chowpatty, Worli, Bandra, Marve, Madh island, Erangal Point, and Chembur. These Malabar Hill, Pali Hill, Worli Hill, Ashta, etc. are indeed residuary hillocks and were at one time part of the main land.

Besides these two—the sandy or at time marshy sea beaches and hills sometimes quite bare, but often covered with green vegetation, their slopes weathering into a reddish soil,—the small intermediate stretch of land, forming the foothills and the plains, also contains the deposits laid down by the Western flowing streams.

These, though running for a short length and not deserving the title of rivers, are very interesting and important. For these illustrate on a small scale several of the features of the river mechanism like erosion, aggradation, re-deposit, and river terraces which one witnesses in a large river. Above all, they contain some of the earliest records of man within Greater Bombay, though in the island of Bombay they are probably now irrecoverably lost. It is therefore quite possible that what was found by Todd and others at Kandivli may well be found right upto a point below Ghod Bandar or south of Bombay on the Ratnagiri coast. For the entire coast must have undergone similar geological and climatic conditions. What is now needed is an extended search along the coast.

With this very brief background about the physiographic features of the west coast, the Kandivli-Borivli area may be described in a little more detail.

As the One inch-to-one mile Survey Map shows, there is a narrow belt of alluvial land varying from half a mile to one and a half mile in width with occasional hillocks, for instance at Andheri (just behind the present Bharatiya Vidya Bhavan), Ambivli —which abuts on or lies against the slowly rising hilly area on the east. Even now it is fairly wooded, and contains three lakes—The Tulsi, Vihar and Pavai. The region immediately east ot Kandivli-Borivli is comparatively very high, the highest peak probably being the Kanheri (the ancient Krishnagiri) hill.

Several small streams wind their way down to the coast to the creeks and estuaries, the most prominent among the former are the Dahisar Nadi and an unnamed Nala to the north-east respectively oi Borivli and Kandivli.

The Dahisar, situated about a mile north-east of Borivli, now flows through the Krishnagiri Upavana (National Park) and flowing north-westwards forms the biggest river.

The Kandivli Nala (to give it a name) is formed into a single nala about a mile north-eastwards from Kandivli station, and turning sharply south-eastwards meets the Malad Creek. However, before flowing as a single stream, it

receives waters from at least seven streams, the northern-most being via Magathan, the southern almost due east of Malad.

The nalas east of Kandivli have cut through nearly two miles, almost the maximum stretch of rising ground or foot-hills. In the process have laid down a fairly thick deposit of pebbles, at times boulder gravels, which sometimes are intercalated by sands and clays, and capped by a thin deposit of humus.

A careful examination also revealed that there were at least two cycles of deposition and erosion. And these in turn might be related to the terrace-like formations which are distinctly visible at Kandivli and Borivli. Thus at Kandivli the part of the nala immediately north, north-east of the Padan Hill shows two interesting sections. The first is to the east of the hill which is being quarried. It appears that over 30 years ago, when this area was being quarried, huge cement blocks were made locally, possibly for filling up the Back Bay. Some of these even now lie just where they were made. For easy transport a road was made. It was perhaps a rail line as indicated by the map. To cross the nala, a small concrete bridge was made. This has now collapsed. Its foundation rested, on the southern side, on the pebbly blackish cemented gravel. However on the northern side, this gravel bed, is covered by clay and sandy deposits to a height of nearly 5 to 7 ft. The top, however, is disturbed and now capped by a fresh rubble on the eastern side, though on the western side, there is a brownish rubble which might be old. (*See Fig. 51-52*)

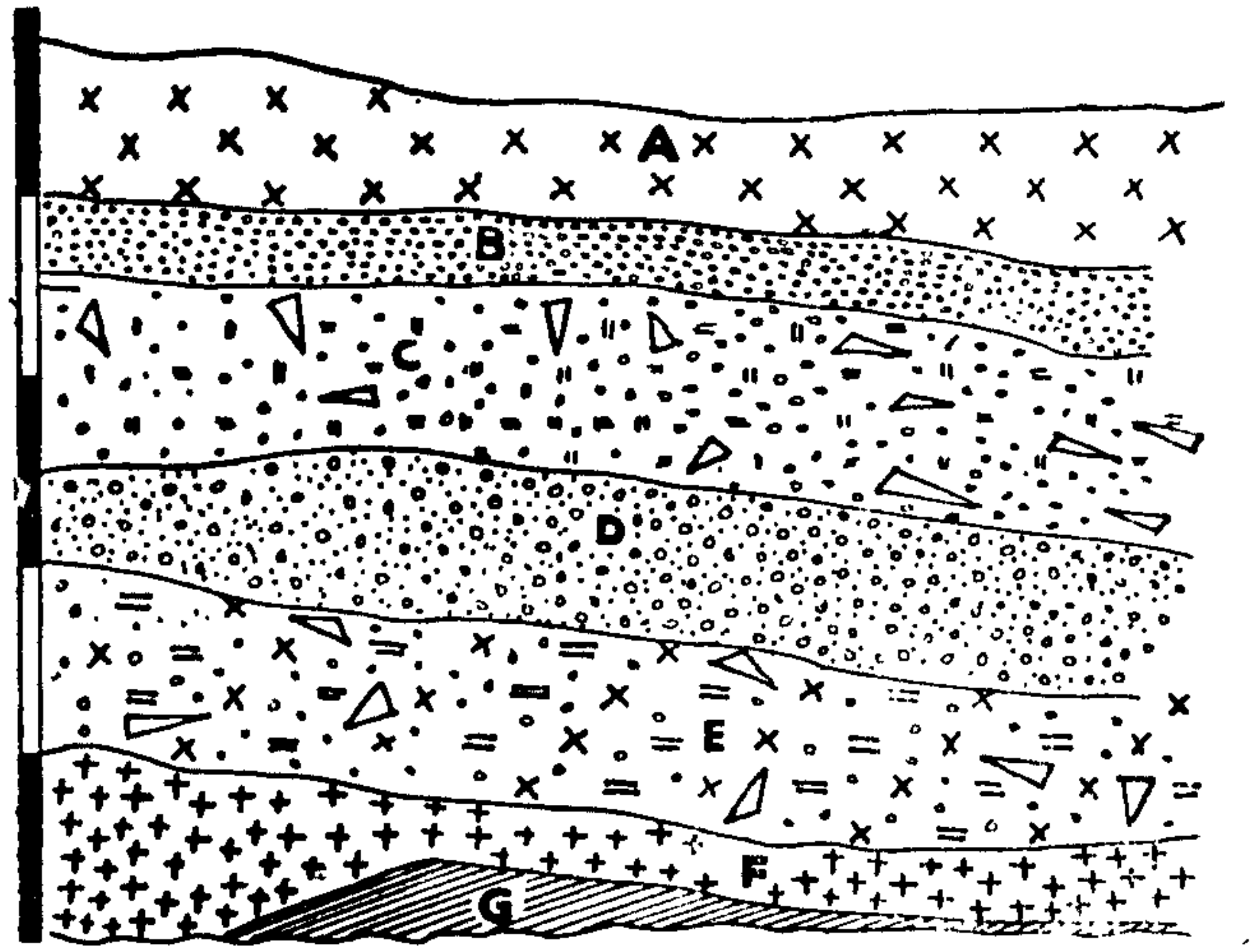
A little further, about 100 yards eastwards, the nala splits into several branches. But the southern-most as well as the one immediately next to it, shows for a considerable distance the accompanying section, its thickness varying with the nature of the ground. For as the rock bench is very high, the gravel and silt deposits are thin or almost non-existent.

To the eye it appears that this portion of the nala flows through a lower terrace, though this observation needs to be checked by actual levelling from a fixed point.

From every point of view—thickness, general appearance and details of constitution—this section appears to be identical with or comparable to the one described and illustrated photographically by Todd. However, a careful scrutiny first by three of us, then by Dr. Subbarao and Shri Malik, and then by all of us in the company of Professor Zeuner showed that the section did not reveal three different formations as described by Todd, but it was essentially one deposit. *Essentially* it consists of a rubble gravel with occasional large boulders or pebbles of basalt (formed not necessarily by fluviatile action, but by spheroidal weathering) laid in a matrix of sandy clay over the basal rock, which at places has weathered into a clayey layer. Thus we find from bottom upwards rock, clay, rubble gravel with sandy partings at places, and the top few inches of dark clay (humus).

As mentioned above, to the eye this gravel appears at a lower level than the first one below the collapsed bridge; secondly, it is more like a rubble, whereas the first has many more small rounded pebbles. Thirdly, this is weathered brownish-yellow and is comparatively loose, while the latter is better cemented,

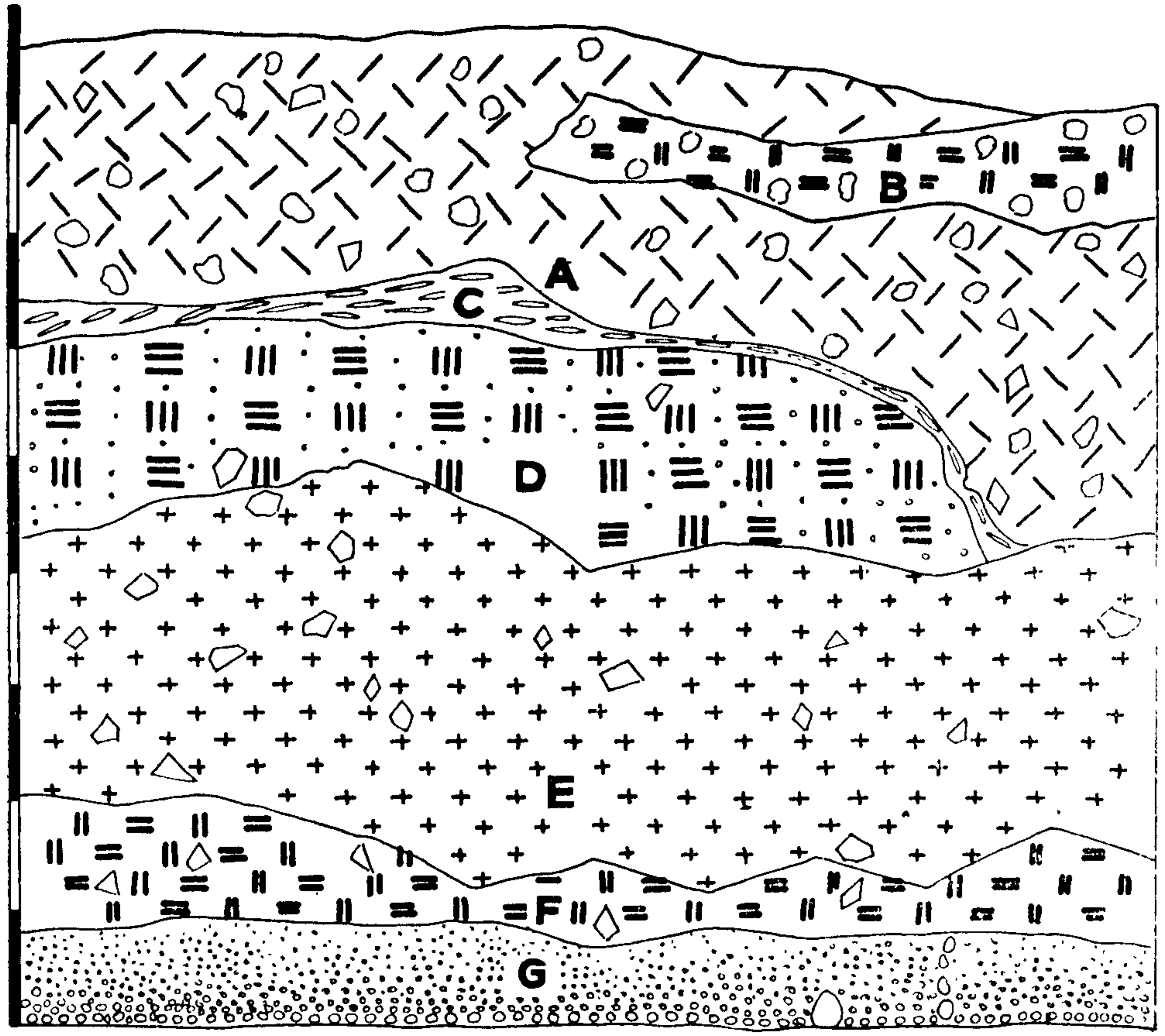
EASTERN SECTION OF NALA 2
BEHIND SCHOOL OF P.C.
AT
KANDIVLI



A – RED SILT
B – FINER GRAVEL
C – UPPER GRAVEL – BROWN ANGULAR ROCKS & GRAVEL
D – PATCH OF SANDY GRAVEL
E – BROWNISH-RED ANGULAR ROCKS & GRAVEL
F – YELLOW CLAY FROM WEATHERED ROCK
G – ROCK (DECOMPOSED)

Fig. 52.

WESTERN SECTION OF NALA 1
BEHIND SCHOOL OF P.C.
AT
KANDIVLI



A Greysh rubble with large angular rocks
B – Brownish rubble
C Small chips at the base of the rubble
D – Yellowish brown clay with very fine few angular rocks and occasional tools
E Yellow clay (silt) with occasional rocks
F Brownish fine gravel with occasional angular rocks and tools
G – Blackish coarse gravel becoming bigger at the base and going beneath it.

Fig. 51.

is stained blackish owing to manganese, while parts of stones and tools are deeply patinated. Thus the latter has all the features of an older and original gravel deposit, while the former might be a re-deposit. If this is so, then we may explain the formation of two gravel sectons as follows : During the first wet phase and the succeeding dry one, the pebble gravel with a comparatively thick silt deposit was laid. This forms the top of the terrace, as we walk over the back of the Padan Hill, and continues southwards to the higher ground, or higher reaches of the nala. Here naturally the thickness of the deposit, as found by us, is nearly 15 ft. or more.

This earlier terrace was cut during the second wet phase, and a rubble gravel consisting mostly of the older material was laid. It was followed by a drier phase when a thin deposit of silt was formed. Sometimes later the present erosional phase started, when the nalas were re-opened.

That such processes have taken place in the region is clearly demonstrated in the Dahisar Valley at Borivli. Here just below the Gandhi memorial, a new pebbly blackish gravel with a thin layer of dark brown silt lies in a hollow cut out from the former gravel, against the weathered brownish gravel. It has also been cut by the river, and thus two distinct terraces can be seen here. (In fact, with this formation the total number of " terraces " on the Dahisar will be at least three).

We have no exact idea as to the number[77] of tools found by TODD at Borivli and Kandivli. Though there is a long exposed section on the Dahisar, no tools were found by us except a microlithic core of carnelian from the top soil; nor did MALIK discovery any.

Kandivli has, however, yielded plenty of tools, because probably there are a large number of outcrops of chert, jasper and fine glassy basalt in the higher reaches. These are weathering *in situ* and may have supplied raw material to the Palaeolithic and Microlithic man.

However, no hand-axes, cleavers and other tools of truly Abbevillio-Acheulian facies were noticed by MALIK previously or by us, though we searched there for a long time. No doubt, there are pieces which superficially look like the illustrations given by TODD, of rostro-carinate, chopper etc.[78] Without being dogmatic, it may be said that the Early Palaeolithic industry is absent at Kandivili.

Our careful collection from (*i*) the basal gravel under the bridge, (*ii*) the overlying silt and sand, (*iii*) the rubble gravel and its junction with the top humus or blackish soil contains (*a*) large and small cores with deep flake scars and corresponding, (*b*) flakes with large prominent undersurface and a diffused bulb, (*c*) cores with occasional parallel flake scars, (*d*) Levallois flakes removed from fully prepared cores, (*e*) scrapers, (*f*) points and borers, made on the above type of flakes or at times on the cores or nodules and (*g*) Burin-like pieces.

77. After writing this paper, I requested one of my former pupils, Professor N. ISAAC, when he was in England last year, to re-examine TODD's collections, if possible. In the appendix is given a tabulated list of tools in the Institute of Archaeology, University of London, kindly prepared by him with the permission of the authorities. I am thankful to both of them.

78. TODD in *J.R.A.I.*, 1939 pp. 261-62.

The total collection is 84. Out of this the basal cemented gravel yielded 30 and the rest, here called "mixed deposit" 54. It may be classified as follows :

Lower cemented gravel...	... 30	3 cores
		8 scrapers
		1 Rostro-carinate
		3 Points or Borers
		1 Burin-facet nodule
		1 Cleaver
		12 non-descript flakes
		1 flake
		30
Mixed Deposit from Nala 1	... 23	1 core
		4 scrapers
		1 Burin-facet nodule
		6 flakes of which 2 are good
		11 non-descript flakes and nodules.
		23
Middle Gravel, Nala 2 ...	... 17	1 core
		1 fine flake
		1 large flake
		1 cleaver
		1 scraper
		1 Burin-facet nodule
		11 non-descript
		17
Junction of Top clay and Gravel	8	1 Large Core
		1 Point
		3 Burin-facet nodules
		3 Non-descript
		8
Surface	6	1 Large Core
		3 Small flakes
		2 Non-descript.
		6

FIG. 53-54

Cores

12 No. 11, KDL. A large amorphous core showing two techniques. On one side two or three flakes have been removed by direct percussion on either side with a stone hammer, leaving deep flake scars and a jagged edge. Almost on the opposite face, there are two shallow parallel flake scars, obviously by pressure flaking ; while on the adjoining face there are series of small shallow scars, mostly due to step-flaking. Where these two flaked surfaces meet, a borer point has resulted, perhaps accidently. The material is basalt and is stained dark black and brown. Found *in situ* in the lowest cemented gravel in Nala 1 on 9-10-1960.

18 No. 7, KDL. A small plano-convex core. One large flake and a small one have been removed from either side. Light yellow. Found *in situ* in the lower gravel on 8-12-1960.

16 N. 6, KDL. Roughly rectangular core from which 7 to 8 flakes have been removed by direct percussion method. The flaking is from the edge. Since the material is fine glassy,

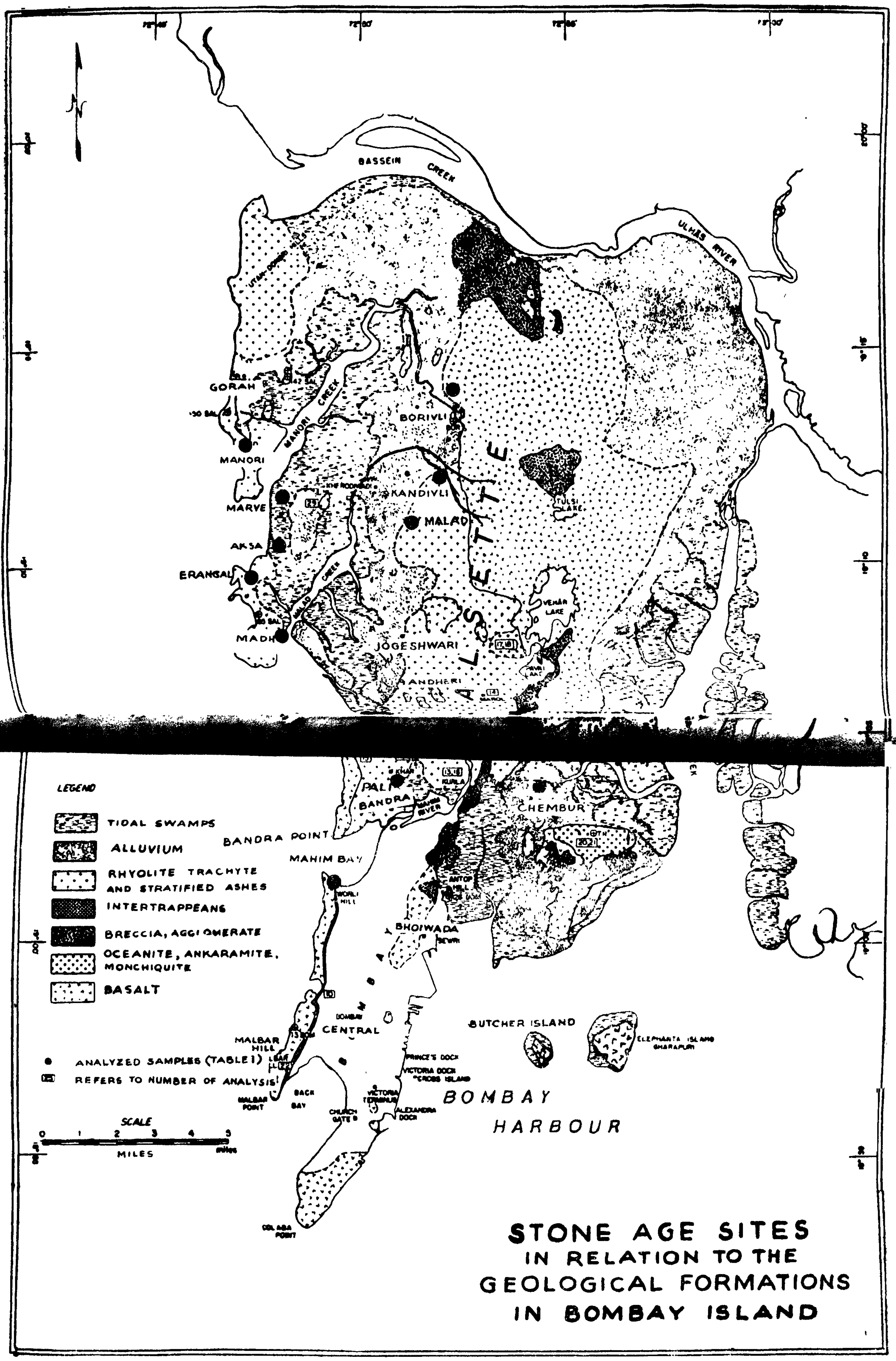

STONE AGE SITES
IN RELATION TO THE
GEOLOGICAL FORMATIONS
IN BOMBAY ISLAND
LEGEND
TIDAL SWAMPS
ALLUVIUM
RHYOLITE TRACHYTE AND STRATIFIED ASHES
INTERTRAPPEANS
BRECCIA, AGGLOMERATE
OCEANITE, ANKARAMITE, MONCHIQUITE
BASALT
ANALYZED SAMPLES (TABLE 1)
REFERS TO NUMBER OF ANALYSIS
SCALE
MILES
BASSEIN CREEK
ULHAS RIVER
GORAH
MANORI
MARVE
AKSA
ERANGAL
MADH
BORIVLI
KANDIVLI
MALAD
JOGESHWARI
VEHAR LAKE
TULSI LAKE
PALI
BANDRA
KURLA
CHEMBUR
BANDRA POINT
MAHIM BAY
WORLI HILL
BHOIWADA
CENTRAL
MALBAR HILL
BACK BAY
CHURCH GATE
BUTCHER ISLAND
BOMBAY
HARBOUR
COLABA POINT

Fig. 50.

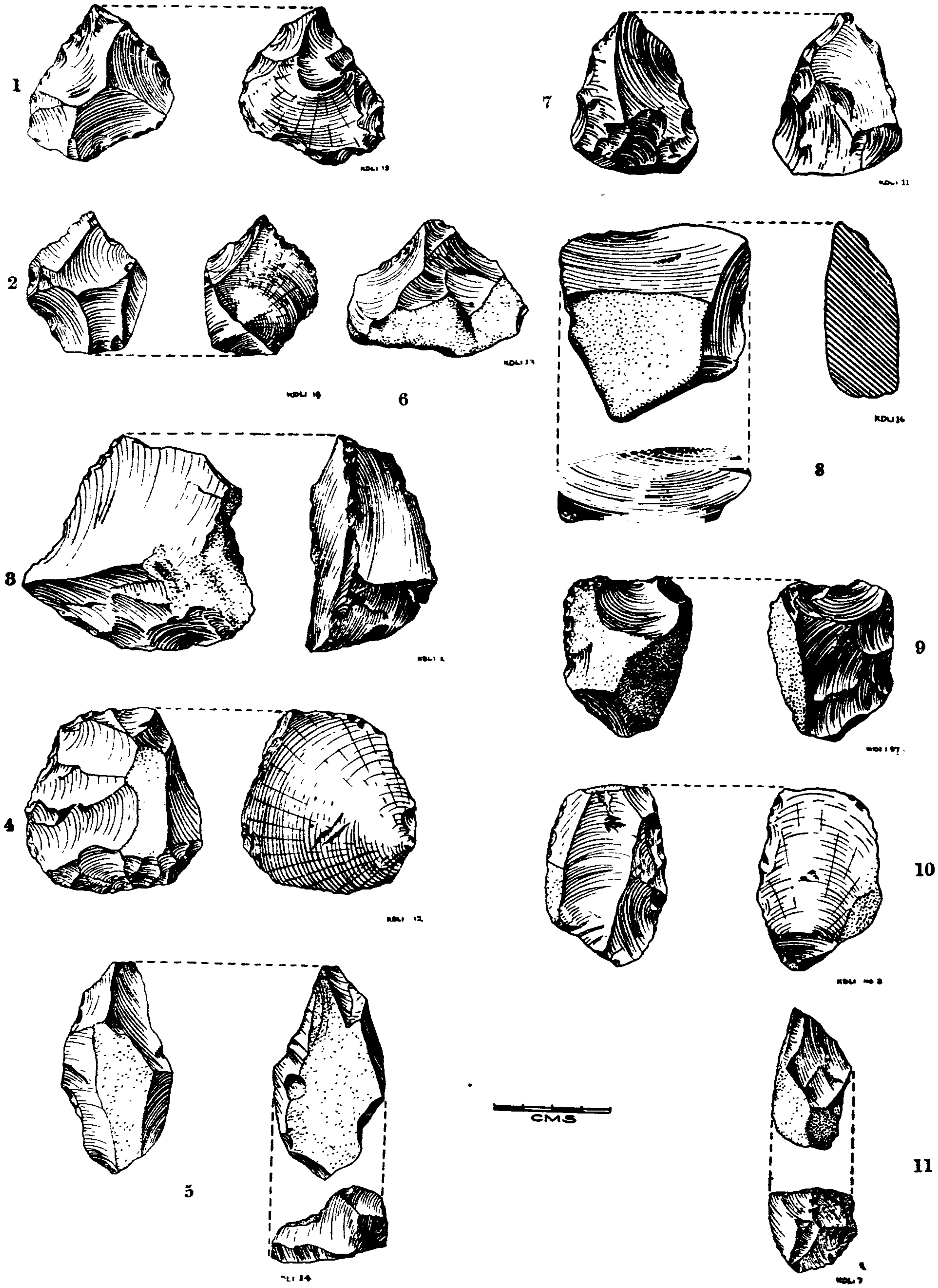


Fig. 53. (1—11) Middle Palaeolithic tools from Kandivli (½).

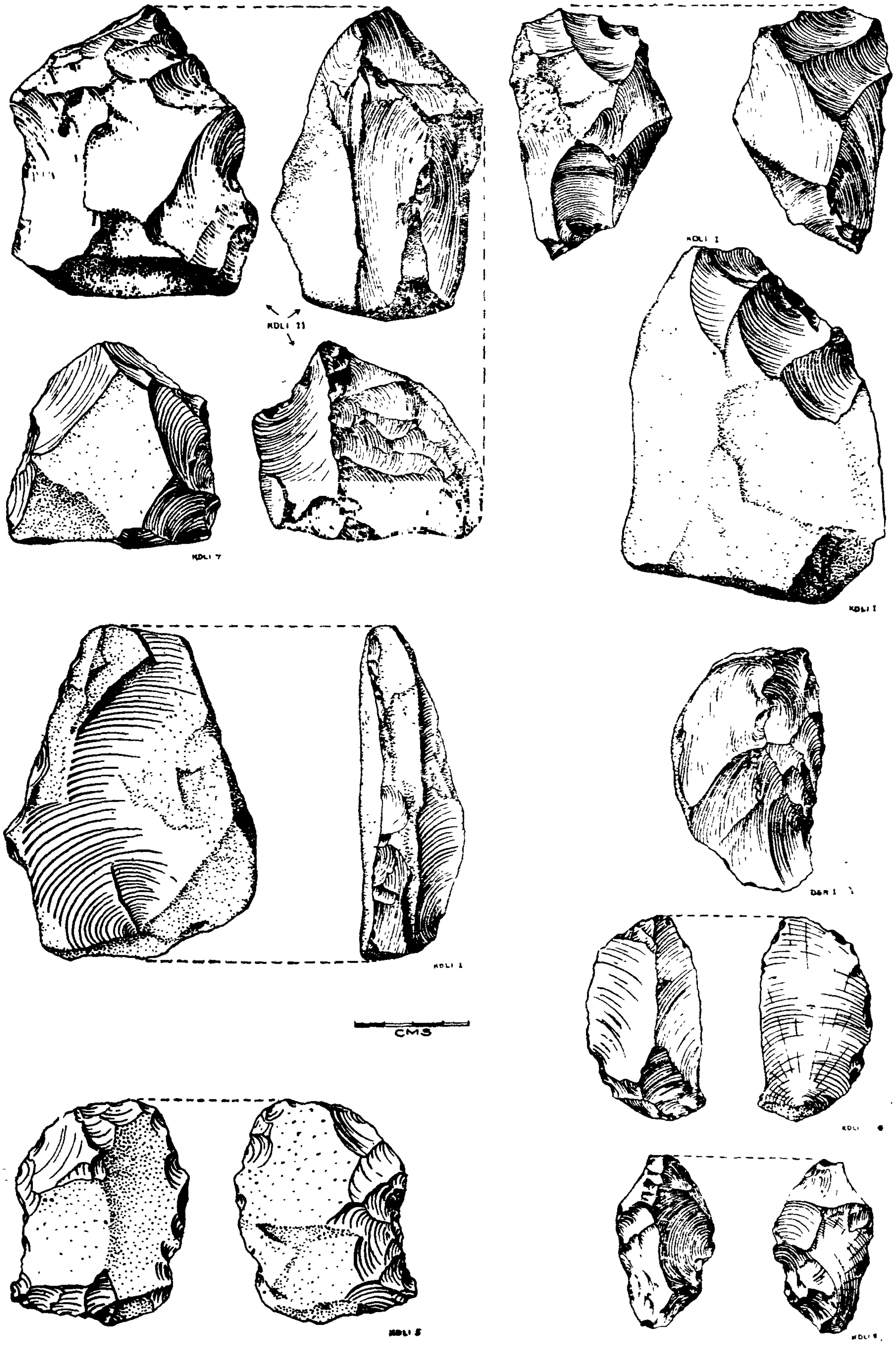


Fig. 54. (12—20) Middle Palaeolithic tools from Kandivli (½).

obsidian-like basalt, the scars are deep. *In situ* lower gravel, Nala 1. Found on 9-12-1960.

10 No. 2, KDL. Rectangular core on a thick flake. From the upper surface a long blade-like flake has been removed. Fine mottled jasper. Found from the Middle Gravel, Nala 2, on 10-12-1960.

17 No. 1, KDL. A large flat steep-sided nodule, from which two flakes have been removed. Brownish basalt, surface.

Scrapers

14 No. 1, KDL. A large semi-circular scraper on a flattish piece. The underside seems to be quite natural. From the upper a large flake has been removed, which along with the thick straight sided back facilitates the handhold. The flat surface slopes steeply. Its margin has been partly retouched and partly battered. Beautiful black-white appearance. Found *in situ* lower gravel on 9-12-1960.

15 No. 5, KDL. A small rectangular scraper-cum-borer on an irregular flattish piece. The margins on two sides are minutely trimmed by step-flaking to yield a scraping edge. The juntion of two adjoining sides ends in a borer-point. Black-and-brownish white. *In situ* lower gravel. 9-12-1960.

1 No. 15, KDL. Scraper-cum-point on a small flattish Levallois-like flake. The upper surface has two flake scars with the margin retouched. The underside having a bulb has also been trimmed so as to give a point and a scraping edge. Brownish chert. *In situ* lower gravel. 10-12-1960.

18 No. 1, DSR. A side-scraper on a thick plano-convex semi-circular piece. The chord has been roughly flaked to give a scraping edge. Brownish chert. Loose from the Dahisar Nadi. 15-12-1960.

12 No. 1, KDL. Scraper on an irregular flake. Only the edge is obliquely retouched. Brownish chert. From the mixed deposit overlying the cemented lower gravel in Nala 1. 8-12-1960.

2 No. 18, KDL. Scraper-cum-point on a small flattish flake. Brownish chert. From the mixed deposit overlying the cemented lower gravel in Nala 1. 8-12-1960.

4 No. 12, KDL. Scraper on a roundish Levallois-like flake. No trace of platform, but where there is a tiny bulb, the upper surface bears some marks of trimming. Black chert. Mixed deposit. Nala 1. 8-12-1960.

9 No. 27, KDL. Hollow Scraper on a thick nodule. Deeply flaked along the margin on two surfaces. Brownish chert. Mixed deposit. Nala 1. 8-12-1960.

19 No. 6, KDL. A small blade-like flake with unfacetted platform and diffused bulb. Black chert. *In situ* lower gravel. Nala 1. 10-12-1960.

6 No. 13, KDL. Borer or a Point on a thick triangular piece with a thick butt. It appears that advantage was taken of a naturally pointed nodule by slightly touching its two sides to yield an effective borer. Blackish-white chert. *In situ* lower gravel. 10-12-1960.

7 No. 11, KDL. Point on a thick triangular nodule with a thick butt. One side and the tip of the point retouched. Brownish chert. *In situ* lower gravel. 10-12-1960.

Cleavers (?)

3 No. 1, KDL. Small cleaver-like piece on a nodule with a thick untrimmed butt. The junction of the two sloping surfaces forming the edge, while the sides are crudely chipped. Greenish chert. *In situ* lower gravel. 10-12-1960.

8 No. 16, KDL. Small cleaver with a pointed flaked butt. Sides crudely flaked. Junction of the sloping surfaces—of which the upper may be natural—forms the edge. Rolled, *in situ* upper gravel. Nala 2. 10-12-1960.

This small cleaver reminds us of a similar cleaver from the Gangapur Dam section found in 1957 at Nasik.[79]

79. SANKALIA, H. D. *The Godavari Palaeolithic Industry*, p. Here *Fig. 30, 5.*

5 No. 14, KDL. A burin-like tool on an irregular longish piece. The chisel-like edge has one side probably vertically flaked.

20 No. 5, KDL. A fine core flake, the underside of which also seems to be worked. Glassy basalt. Upper gravel. Nala 2.

11 No. 7, KDL. A burin-like tool on a thick nodule. The undersurface is naturally flat. The two sides on one end meet in a chisel-like broad edge. Mottled jasper. Middle Gravel. Nala 2. 10-12-1960.

From the analysis of the tool collections from the different horizons as well as a description of the important types, it will be seen that the same tools which occur in the lowest layer of cemented gravel in both the Nalas occur in what we have called "mixed deposit" in Nala 1 and "middle and upper gravel" in Nala 2. While the old or previous types may be found in the succeeding deposits, some new types-indicating a new industry or culture - should be there. This is either absent or we have so far not found what is called the "Upper Palaeolithic blade element". Likewise the true Lower Palaeolithic complex of handaxes and cleavers is also missing. No doubt, there are a couple of cleaver-like pieces, one from the lowest gravel. But these are not indeed sufficient to change the nature of the industry which mainly seems to comprise scrapers, points and borers.

The burin-like pieces were also examined by Professor ZEUNER. While the typical burin-facet intentionally given to give a chisel-edge does not seem to be in evidence, still it is possible that such chisel-ended pieces were naturally available in the locality owing to the peculiar nature of the rock and probably used by man, though for the latter view, we have very little proof either.

These tools may be compared with those illustrated by TODD. Our collection also includes crude handaxe-like specimens, and two small cleavers. But the rest are points, borers and scrapers. These are all made in the form and technique visible in what is now called Series II or Middle Palaeolithic (or Stone age) tools from Maharashtra, Karnatak, Andhra, Orissa, Central Provinces, Central India and Western Rajputana.

Whether this Stone Age Culture was followed by the one in which long blades and burins and gravers played a prominent part or was immediately succeeded by one in which microliths come into the picture, cannot be said for certain. For our collection of burins from the "mixed deposit" is of doubtful nature. Probably a further intensive search, which is planned, may help elucidate the problem.

Gujarat

Northern and Central Gujarat which have given abundant evidence of the Early Palaeolithic and Microlithic cultures have so far not yielded tools of the Middle Palaeolithic. The main reason is that the region has not been examined from this point of view. The Sabarmati and its tributaries call for a fresh exploration. Twenty years ago this aspect of the Stone Age cultures was not known. Consequently, tools if found, were likely to be mixed up with microliths.

Recently Shri SOUNDARA RAJAN[80] discovered a few tools in a fine gravel deposit lying as a small terrace against or under the thick deposits of loamy silt,

80. SOUNDARA RAJAN, K. V. "Middle Stone Age Sites from Kaira District in Gujarat", *Journal, Oriental Institute*, Baroda, Vol. X, 1960, pp. 166-79.

which are such a characteristic feature of Gujarat, on the Mohor River. If this gravel really underlies silt, then it is of some antiquity. That probably it is so, is suggested by the borings at Lunej, near Cambay, where an earlier - Middle Pleistocene - and later gravel strata intercalated by silts and sands are reported. Thus the stratigraphical position of the tools, if found *in situ*, is not uncertain.

However among the 30 tools of chert and agate there are a few fluted cores, which normally characterize the later microlithic industry. Thus a shadow is cast on the assemblage. It may be a mixed lot, and the patches of gravel, as SOUNDARA RAJAN himself says, possibly contaminated by later re-wash.

Saurashtra

Occurrence of tools, called Series II, is known from a number of sites in Saurashtra,[81] but so far no detailed report is available nor had the writer an opportunity to examine the collections.

Since this was written, an interesting secton was noticed by the writer at Jetpur, on the left bank of the Bhadar river in the Central Saurashtra. It is nearly 30 ft. high. Over the basaltic rock (curiously) there is about 10 ft. of brownish clay or silt. This is capped by a 5 ft, or so layer of blackish cemented gravel. Over this rests a huge 15 ft. deposit of sandy silt, its top strewn with kankary gravel.

Five tools were collected in a few minutes. All these, as in Maharashtra, are on thick or thin flakes of jaspery chert, available as veins in basaltic rock. All the tools may be described as scrapers. There is a fine side scraper on thick, crescentic but angular flake; another a hollow scraper on a thin flake; and third, an end scraper on a symmetrical semi-cirular flake.

These were collected from the surface, but their most likely source is the cemented gravel bed. If this is so, then somewhere on the same river, another gravel bed, a lower and earlier one—is expected. This might, as at Nevasa, contain tools of the Early Stone Age on dolerite, a few flakes of which the writer noticed on the high ground near Rojadi on this very river. In fact, a careful survey at this Harappan site is likely to yield a sequence of cultures as at Nevasa.

Distribution of Middle Palaeolithic Culture (*See Fig. 55*)

Our surveys shows that the tools called Series II or Middle Stone Age or Middle Palaeolithic or Nevasian have a wide distribution covering Maharashtra (including Konkan), North Mysore, Andhra (particularly northern districts), the whole ot Madhya Pradesh, Bundelkhand (which includes south-western Uttar Pradesh), Orissa, Western Rajputana Saurashtra and probably Madras as well. To this we might add Sind, particularly the site ot Sukkur,[82] which, atter the data trom Luni valley gathered by MISRA, seems to belong to this complex. Further systematic research would show its extension along the western and eastern coast, as well as in Mysore and Madras. Is it really absent

81. *I.A.R.*, 1957-58, p. 18 ; 58-59, p. 69.

82. De TERRA and PATERSON, *op. cit.*, p. 333-5, though even the earliest Group A includes a large number of blades.

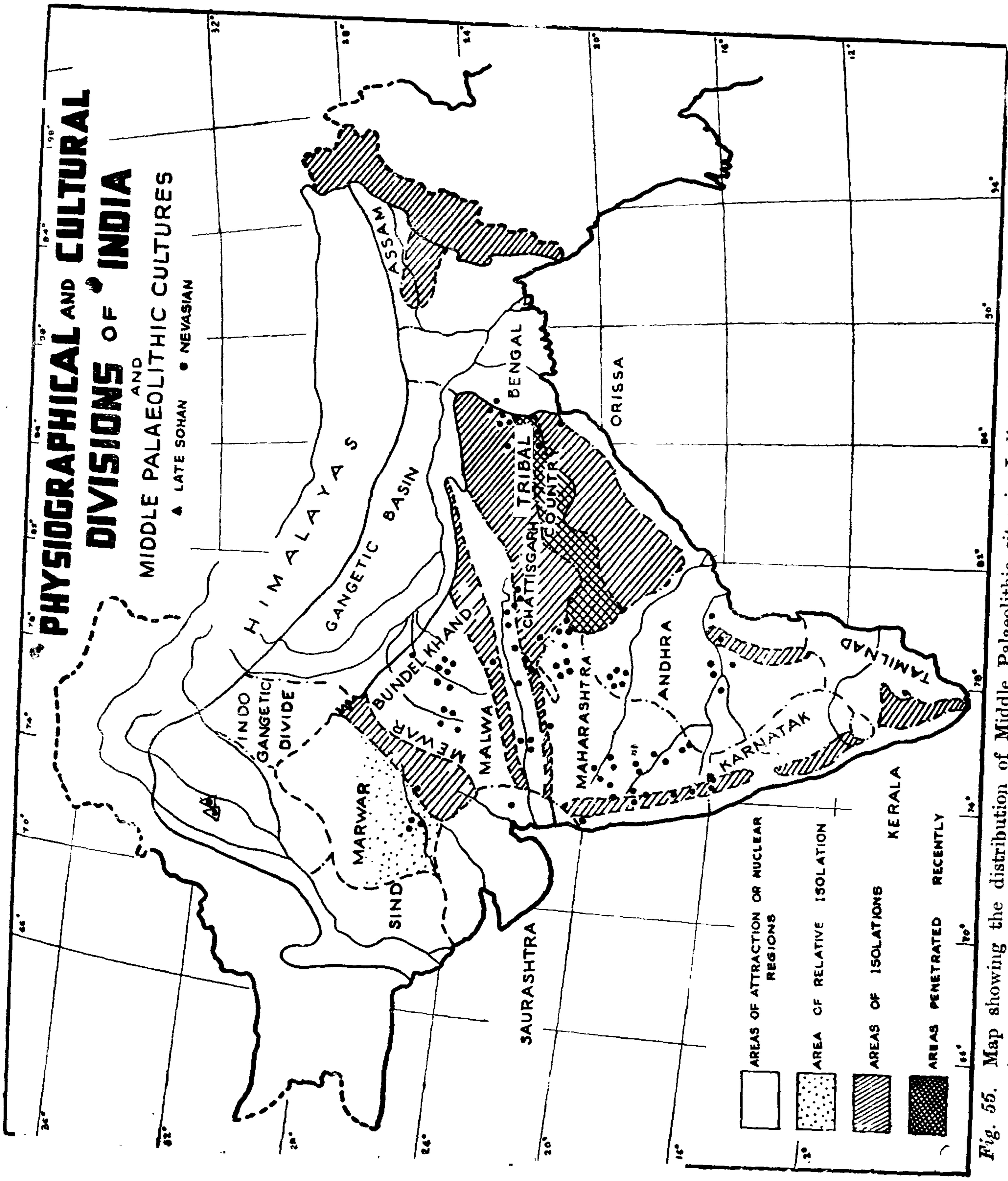


Fig. 55. Map showing the distribution of Middle Palaeolithic sites in India. Sites in Sind, *viz.*, Sukkur and Rohri have been inadvertently omitted.

from Gujarat proper? Recent reports, though not very convincing, argue for its presence there. Thus it may be said that the area of its distribution is almost coextensive with that of the Early Palaeolithic.

There is little doubt about the stratigraphical position of the tools. This is generally fine gravel belonging to the second aggradation cycle. The gravel in its turn is capped by a layer of thick silt or sometimes another gravel. This observation has also been independently made by BRIDGET ALLCHIN.

Chief Features

Regarding the character of the tools, she has noted the constant occurrence of scrapers of several types as well as awls, on all the sites she visited. Her collection also includes small choppers and chopping tools. We are not sure of the last two, for certain scrapers in our collection might be described as such, though these are also comparatively rare. She thinks that small hand-axes formed originally a part of the tool-kit of this culture, but later dropped out. The association of a small hand-axe with the scraper, the awl and the point was first observed in a stratified context at Nevasa, and has been noticed in Kurnool, Malwa, Bundelkhand and Western Rajputana.

ALLCHIN has commented on the absence of a true point and added that the man of the period must have had to depend upon hard wood as the only alternative for spears or arrows. Such a conclusion is unwarranted. For fine points, fully or partly retouched on the two lateral sides are reported from a number of areas, whereas MISRA has in his collection from the Luni, points worked on both the faces. Larger points characterize SINGH's collection from the Betwa. These small or big points must have been used as arrow or spear-head respectively.

Cultural Affinities

Two other considerations deserve our attention. The first is the relation of this Nevasian or Middle Palaeolithic culture of Peninsular India with that of the Panjab, viz. the Late Sohan.

On geological grounds both the Nevasian and the Late Sohanian can be placed into the Late or Upper Pleistocene and assigned to the Middle Palaeolithic or Stone Age culture complex. But it is difficult to say on the strength of De TERRA and PATERSON's statement that certain flake tools of the Narbada were comparable with those of the Late Sohan, that these two cultures are related or typologically fall within this period, as suggested by ALLCHIN. For very little is known of the Narbada tools mentioned by De TERRA. He has not illustrated any. Nor anyone among the present writers has handled both. Thus we are not sure of what we are comparing, typologically or stratigraphically. For one thing, though the Late Sohan does contain a fairly good percentage of flakes on prepared cores, still very few points, awls or borers and various types of scrapers reminiscent of the Nevasian or the Peninsular Middle Palaeolithic are seen. However, if we are to depend upon illustrations, among the twelve flakes of Late Sohan A, one may cite Nos. 9 and 11 as scrapers and Nos. 10 and 12 as double hollow scraper and awl respetively. Thus typology is not a good guide in this respect.

Limitation

For the present, in the absence of a first hand study of both the assemblages, it would be better to regard the Late Sohan and the Nevasian, at the most homotaxial and falling within the Middle Stone Age or Middle Palaeolithic Period of India. But it should be remembered that both belong to very different environmental--climatic and ecological—regions. Thus the homotaxiality has also a limited significance.

Origin

The second is the important question of the origin of this culture. Its antiquity is undoubted, so also its long survival, probably culminating in the microlithic industries of the Holocene.

BANERJEE[83] had postulated after his detailed study of the Nevasa (the Deccan) and North Karnatak material that this culture had evolved out of the earlier hand-axe-cleaver culture, because techniques like the block-on-block, cylinder hammer characterized both, as well the borer which is a type tool of the Nevasian is also available, though very rarely, in the earlier industry.

Similar is the view of ALLCHIN,[84] who also thinks that " it (this culture) was in early stages at any rate, in contact with comparable industries in Central Asia and later developed in comparative isolation in the regions south-east of the Sind desert for a long time...," whereas, earlier[85] she had said that " the closest parallel, in terms of environment and stone technology is provided by the Middle Stone Age industries of Africa, south of the Sahara. "

Africa or Central Asia ?

Regarding the indigenous evolution out of the hand-axe-cleaver industry, it may be said that though the presence of a few small hand-axes and large borers on quartzite flakes and two essential techniques may be cited, still the fundamental fact remains that by and large the people of this culture had little need for tools like the hand-axe and the cleaver. Hence they gave up the quartzite and other material in preference to other material of much finer quality, but very often much smaller in size, which was suitable for their purpose. All this suggests basic change in the life of the people, and probably the people themselves. Arrival of new cultural influences is definitely indicated. This should be most probably from Africa. It may be north[86] or south of the Sahara or even both. The existence of tanged tools may point to the former. Central Asia may be another source for the Late Sohan, as suggested by ALLCHIN, but not for the Peninsular Middle Palaeolithic, unless comparable tool types of earlier or comparable date can be cited from Iran[87] and other sites in the same region.[88]

83. *Middle Palaeolithic Industries of the Deccan*, p. 291.

84. *Op.cit.*, p. 35.

85. ALLCHIN, *op. cit.*, p. 29.

86. MACBURNEY, C. B. M., *The Prehistory of North Africa.*

87. COON, C. S., " Cave Explorations in Iran, 1949 " *Mus. Mon. Univ. Pennsylvania* (Philadelphia, 1957).

88. OKLADNIKOV, A. P., " Papers for the Institute of Scientific Research, Moscow ", (Tr. by MOVIUS, H. L., *Amer. School of Prehistoric Res. Bull.*, No. 17, 1953.

Evidence is increasingly coming forth from this, so far scantily explored part of Asia, of stone industries and human physical types which are described as Mousterian. The leading characteristics of the industry are (*i*) discoidal core, (*ii*) points on Levallois flakes, (*iii*) scrapers with steep retoutch.[89] Now all these features do mark the Nevasian occasionally in some regions, or comparatively frequently in others, say Western Rajputana and Bundelkhand. But this is not sufficient to derive the Nevasian from Central Asia, or even establish a typological similarity.

In truth, much more stratigraphical and other data as well as first hand comparative study of the Indian, African and Central Asian industries is necessary before something definite can be said about the origin and relationship of the Middle Palaeolithic—Nevasian and Late Sohanian—culture.

89. See for instance, *Movius, Hallam, L.*, " Palaeolithic and Mesolithic Sites in Soviet Central Asia ". *Proc. Am. Philosophical Society*, Vol. 97, No. 4, 1953. Particularly striking are the side-scrapers and points from the cave of Teshik-Tash, Baisum Region, Uzbekistan. A brief description of this and other sites since discovered is given by Mognait, A., *Archaeology in the U.S.S.R.* (Translated by M. W. Thompson), Penguin, 1961, pp. 82-7.

CHAPTER III

MESOLITHIC CULTURES OF INDIA

Origin of the Term

THIS division of the Stone Age Culture is comparatively very new for India and also new in the development of prehistoric archaeology in Europe as well. Until 1865 the development of man was divided as mentioned before into three broad divisions, the Palaeolithic Age, Copper Age and the Iron Age. It was however recognized that there were two sorts of stone implements which were quite different typologically—in shape and technique—and therefore Lord AVEBURY suggested in his book *Prehistoric Times* the use of the word "Neolithic." Even this was not found to be sufficient because among the chipped tools there were various groups and it was until very recently believed that the term "Mesolithic" was introduced by JACQUES de MORGAN to distinguish a transitional phase between the Palaeolithic and the Neolithic cultures.[1] However, it has now been shown by Judith WILKINS[2] that this term had been used as far back as 1866 by HODDER M. WESTROPP to distinguish the Lower Palaeolithic tools from the Neolithic. Unaware of this usage OTTO TORELL had coined this term in Sweden in 1874.[3] Thus the term is nearly 100 years old. It has not merely a simple connotation of a transitional phase, between the Old Stone Age (Palaeolithic) and the New Stone Age (Neolithic), but it stands for a great change in the tools of man as well as the climatic conditions in the regions in which man lived.

Stratigraphical Position

It was formerly believed that there was a hiatus between the Palaeolithic and the Neolithic. No body seemed to know what happened to the Old Stone Age man and how he passed into the New Stone Age. A great gulf appeared to divide these two periods. Then the excavation at Mas d'Azil in France in 1895 showed that there was no real hiatus between the palaeolithic and the neolithic. The discovery of this famous section made scholars look for similar evidence elsewhere. Till now very few places in Europe as well as in Africa have given such ideal data in which the Upper Palaeolithic culture is found in a lower stratum and the Neolithic culture is found lying above a stratum in which Mesolithic culture is still preserved.

Environment

The *milieu* in which this culture was found has been studied in very great detail by a number of European scholars among whom J. G. D. CLARK of England is the most prominent. His two works *The Mesolithic Age in Britain* and *The Mesolithic Settlements in North-West Europe* have shown that the conditions under which man lived in Europe as well as England were far different from those that obtained when the Upper Palaeolithic man lived in the caves and rock shelters of France, England, Germany, Czechoslovakia etc. The cold had gone and with that the large animals—mammoth, reindeer, cave bear and others. A

1. Daniel, Glyn, E., *The Three Ages*, Cambridge, 1943, p. 25.
2. *Antiquity*, Vcl. XXXIII, 1959, p. 130. And therefore ALLEN BROWN's usage in 1892 was not the earliest.
3. *Ibid.*, p. 220.

more temperate, genial, climate had come over during which the country had become comparatively barren and open. Of course, there were wide regional differences ; for instance what one may find in the swampy areas in Denmark or Holland and the dry areas in France. But the one characteristic that ties all these areas and the cultures unearthed from them is a tiny stone implement, generally called "microlith." These microliths, as pointed out elsewhere, have various subdivisions and groups. Of late, inferences are even made from the types of tools regarding the character of the microlithic culture—such as Hunting, Fishing and Incipient Agriculture, or a combination of the first two or all. Thus these microliths which bridge the gulf stratigraphically between the Palaeolithic and the Neolithic are not only different technologically from the earlier and the later stone tools, but once again show the economic stage in which man lived as well as his environment. In one sense it was a retrogression. For, as far as Western Europe was concerned, no longer do we find the beautiful tools and the art in ivory, soft stone etc. of which France, Italy, Germany, Czechoslovakia and Southern Russia have given us beautiful specimens. Nevertheless, the tools when studied scientifically show that man had now devised a compound tool. It means only this : that small tiny implements were hafted and not used singly, but a series of them were employed to prepare an arrow-head or spear-head or a sickle. It is this invention of a highly advanced principle which is to be emphasized while judging the Mesolithic culture in India or elsewhere.

It is however true and cannot be too much emphasized that all microliths, wherever found, do not suggest or stand for a mesolithic stage of culture. Microliths have been found in India from the last century and the distribution will show you that there is no corner of India where they have not been found.[4] But it does not mean as some people think that the Fergusson College Hill or the Pandharpur region was the home of the mesolithic culture, because some microliths have been found at these places. It is the context, the stratigraphy, that is the most important criterion for judging whether a mircolith belongs to the mesolithic stage or not.

Applying this criterion to discoveries in India, one has to admit that in spite of the work that has been done during the last 20 years, there are no ideal sections like that of Mas d'Azil. Nowhere in India microliths immediately overlie the Palaeolithic and underlie the Neolithic. It is therefore not true to say that we have got definitely mesolithic cultures comparable to those in Europe or Africa, either in time or content or stratigraphy.

This being the case what can be done at present is to describe a few typical sites, where microliths have been collected very carefully from excavations or otherwise and studied scientifically and then to arrive at the age and nature of the culture from other associated data.

Microliths

The microliths usually comprise a fluted core from which a large number of parallel-sided flakes have been taken out. Often this core is not so regularly fluted, but irregular and a close examination of it will show that the flakes have been removed from several sides called technically "platforms."

4. Barring the exceptions mentioned below.

So a site like Langhnaj may give fully finished fluted cores and irregular cores as well. The flakes removed from these are comparatively small, not more than an inch or an inch-and-a-half and the one criterion to judge whether these are tools intentionally made by man is that they should be retouched by secondary working either on one edge or both the edges. It may be that these simple flakes, because of the sharp edges, were utilized by man. But there is no evidence with us to say that these were intended by man and hence retouch is an essential guide for defining a microlith.

Normally microliths comprise the following: cores, fluted and irregular with many platforms; parallel-sided flakes or blades; scrapers of many types—side, hollow, steep, round etc. according to the nature of the re-touch on the tool; triangles—scalene, equilateral, isosceles,—trapeze, burins, lunates or crescents. The last two may be retouched either on the curved (convex) back or on the chord sides, but rarely on both. It has been shown by studies in England that these omnibus group may be divided into (1) Geometric microliths comprising mainly triangles, trapeze etc. and (2) non-geometric. Stratigraphically, the latter precedes the former in some of the type sites in Europe as well as in Africa.

A further distinction is sought to be made by the study of the tool types as mentioned above into microliths used for hunting, for fishing, or for agricultural purposes or for all together. With this introduction the important sites where microliths have been found in excavations or closely observed conditions have been dealt with here.

Mode of Occurrence

Hitherto microliths have been found in the following contexts:

- I Microliths with Palaeolithic-like tools. For instance in Kurnool,[5] Kandivli[6] and Marahna (Morhana) Pahar in Rewa.[7]
- II Microliths with pottery, from surface.
- III Microliths from hill-sides, rock-shelters and sandy plains, as in Bombay,[8] Central India,[9] Northern Gujarat[10] and W. Rajputana[11] and *teris* of S. India.[12]
- IV Microliths with a little pottery from excavations. For example, Langhnaj,[13] Panchmarhi.[14]
- V Microliths without any pottery from excavations.[15]
- VI Microliths with painted pottery and copper tools.[16]

5. CAMMIADE, L. A., "Pygmy Implements of the Lower Godavari," *M.I.*, IV, 1924, and *A.I.*, No. 6, p. 71-2.
6. TODD in *JRAI*, Vol. LXIX, 1939, p. 267.
7. BROWN, J. A. in *JRAI*, Vol. XVIII, 1889, p. 137, and *A.I.*, No. 6, p. 65. Here the upper layer contained microliths, but beneath it, separated by a distinct line of stratification, were much older implements, and of much larger size, formed of indurated sandstone etc.
8. TODD in *A.I.*, No. 6, 1950, pp. 1-11.
9. GORDON, D. H. in *A.I.*, No. 6, pp. 64-90 and earlier references.
10. SANKALIA, H. D., *Prehistoric Investigations*, 1946 and *JGRS.*, Vol. XVIII, 1956, pp. 275-84.
11. MISRA, *op. cit.*, and TODD's collection from Karachi.
12. ZEUNER and ALLCHIN, in *A.I.*, No. 12, 1956.
13. SANKALIA, *op. cit.*
14. HUNTER, G. R., in *Nagpur University Journal*, Nos. 1-2, 1935-36; and GHOSH, in *I.H.Q.*, Vol. XXIV, 1948.
15. LAL, B. B., in *A.I.*, No. 14, 1958, pp. 4-48.
16. SANKALIA, H. D. and others, *Excavations at Nasik and Jorwe*, *Excavations at Maheshwar and Navdatoli* and *From History to Prehistory at Neavsa*, 1960 and yearly notices in *I.A.R.*, 1953-61.

From these six modes of occurrences we can now easily eliminate the last and to some extent the first. Excavations during the last 10 years or so and a detailed study of the tiny stone tools occurring in them has shown that these tools, though tiny, should not be called microliths. For in them parallel-sided tools preponderate. It is really a " Short Blade industry."[17] Thus it is possible to distinguish between such blades and true microliths. Hence a large group, even of surface tools and their geographical occurrences can be plotted on a map and thus removed from the distribution of microliths.

Derivation

Likewise, tools found in certain context by scholars like De TERRA and HAIMENDORF and included under microliths by GORDON[18] and KRISHNASWAMI,[19] though comparatively small, are now known to precede the true microliths by a considerable time and also differ typologically. It is possible that microliths have been derived from these tools.

Upper Palaeolithic

With regard to the association of microliths with palaeoliths in Kurnool, Kandivli, Sangankallu and Morhana Pahar in Rewa, it has been suggested by GORDON[20] and after him by KRISHNASWAMI[21] that such a context might indicate a succession of the Mesolithic after the Upper Palaeolithic. What can one say is that such associations are highly suggestive, but should not be accepted without further scientific scrutiny. CAMMIADE's observation, though highly significant, was made in the last century when this subject was little studied as today. CAMMIADE's collection appears to be surface and hence no reliance can be placed on it. Kandivli is suspected as mentioned above. Sangankallu needs a much larger excavation before fancy theories are built on the patinated flakes of Levallois type. However, we should not exclude the possibility of these or any other site yielding us the true Upper Palaeolithic types of tools—both of stone as well as of bone. FOOTE had compared his collection of bone tools from the Billa Surgam caves with the Magdalenian of France. Unfortunately this collection is lost. Recently renewed excavation at Burzahom[21a] in Kashmir, near Srinagar, has yielded some of the finest bone points, awls, needles and harpoons. The age of these is not known.[21b] It might not go back to that of the Upper Palaeolithic in Europe but may bear some relation with that found in Iran by BRAIDWOOD.[22] Never-the less the discovery is most welcome, as it adds considerably to our knowledge.

When these two or three groups and modes of occurrences of microliths are eliminated, we are left with (*i*) surface microliths, with or without pottery (*ii*) microliths from excavation, and (*iii*) microliths from certain geological deposits.

17. SANKALIA, H. D. and DEO, S. B., *Excavations at Nasik and Jorwe*, p. 51; and SUBBARAO, B., *Excavations at Maheshwar and Navdatoli*, p. 41 ff.

18. *A.I.*, No. 6, p. 65.

19. *A.I.*, No. 9, p. 67.

20. *A.I.*, No. 6, p. 65.

21. *A.I.*, No. 9, p. 63.

21a. See here Pl. XXXII.

21b. C-14 date is around 1,800 B. C.

22. *Illustrated London News*, October 22, 1960, pp. 695-97.

Age and Distribution (See Fig. 56)

With regard to microliths, two assertions are often made. First that microliths have been found from practically every corner or part of India.[23] Secondly, that they continued to be used up to the 10th century A.D. When these statements are examined, it would appear that these need to be qualified. In the first place such statements ignored the basic differences in types of microliths and their modes of occurrence. Secondly, they were made when little was known of the cultures called "Middle Palaeolithic" and the "Chalcolithic Short Blade Cultures," respectively. Thirdly, even without excluding these two, as done by us, it will be found that no microliths have been reported from Assam, Bengal, Nepal, the Gangetic Valley proper, the plains of the Panjab[24] and Kerala. While the subsequent explorations have shown their existence in Western Orissa[25] and Western Rajputana[26] which were formerly blank, it is difficult to say whether the absence in the above mentioned regions is due to want of exploration or related to the geographical causes. Thus the absence in Assam and Nepal may be due to thick forests and altitude, and in the Panjab plains, the Gangetic Valley and deltaic Bengal, for want of suitable raw material and environment. The same may be the case with Kerala. Even within the known distribution of microliths, a strict demarcation based on the availability of raw material and ecology—that is surroundings or environment—is necessary. Except for four or five areas, very little is known about the rest. However, there is no positive proof to say that microliths continued to be used in secluded semi-forested regions up to the 10th century A.D.[27] This is one of those statements which gains currency when oft-repeated. None of the present primitive, aboriginal tribes, like the Chenchus, use microliths today, nor there is evidence that they did so, a thousand years ago.

Eastern India

In Eastern India the most important site to date is Birbhanpur, on the bank of the Damodar river. This river, however, rises in the Chota Nagpur plateau on the west, and though at present the site is included in West Bengal, geographically it belongs to this region. Other sites in chronological order are those noted by BEECHING[28] near Chaibasa and Chakradharpur in Singhbhum District in 1868, by DRIVER[29] near Ranchi in 1887, by BODDING[30] in the Santal Parganas in 1904, by ANDERSON in the Sanjai Valley in 1917,[31] by MAJUMDAR[32] near Durgapur in 1937 and by LAL in 1954 (the same as

23. WHEELER, R. E. M., in *A.I.*, No. 4, 1947, p. 299 and GORDON, D. H., in *A.I.*, No. 6, p. 67 and KRISHNASWAMI, V. D., in *A.I.*, No. 9, p. 64.

24. Beyond the hilly Afghan frontier, Jamal Gahri Cave, former Mardas District, N.W.F.P., GORDON had long ago (*Man*, 1938, p. 63) noted the occurrence of microliths, but whether these are true microliths or belong to the Chalcolithic blade complex is difficult to say in the absence of illustrations or first hand study.

25. MOHAPATRA, *op. cit.*, p. 269.

26. MISRA, *op. cit.*, p. 207.

27. This was GORDON's view (*Arts and Letters*, 1936, pp. 34-41), and has been shown to be incorrect by the writer. SANKALIA, *Investigations*, p. 150. Further, it was said recently that microliths were made of bottle glass in Mahableshwar because a core-like object was found. Unless actual blades are found in use, this view should not be accepted.

28. BEECHING in *P.A.S.B.*, 1868, p. 177.

29. WOOD-MASON in *J.A.S.B.*, Vol. LVII, 1888, pp. 387-96.

30. BODDING, P. O., in *J.A.S.B.*, Vol. LXXXIII, 1904, pp. 27-31.

31. ANDERSON, G. W., in *J.B.O.R.S.*, Vol. III, pp. 349-62.

32. *A.S.I.,A.R.* 1937-38, p. and *Revealing India's past*, p. 116.

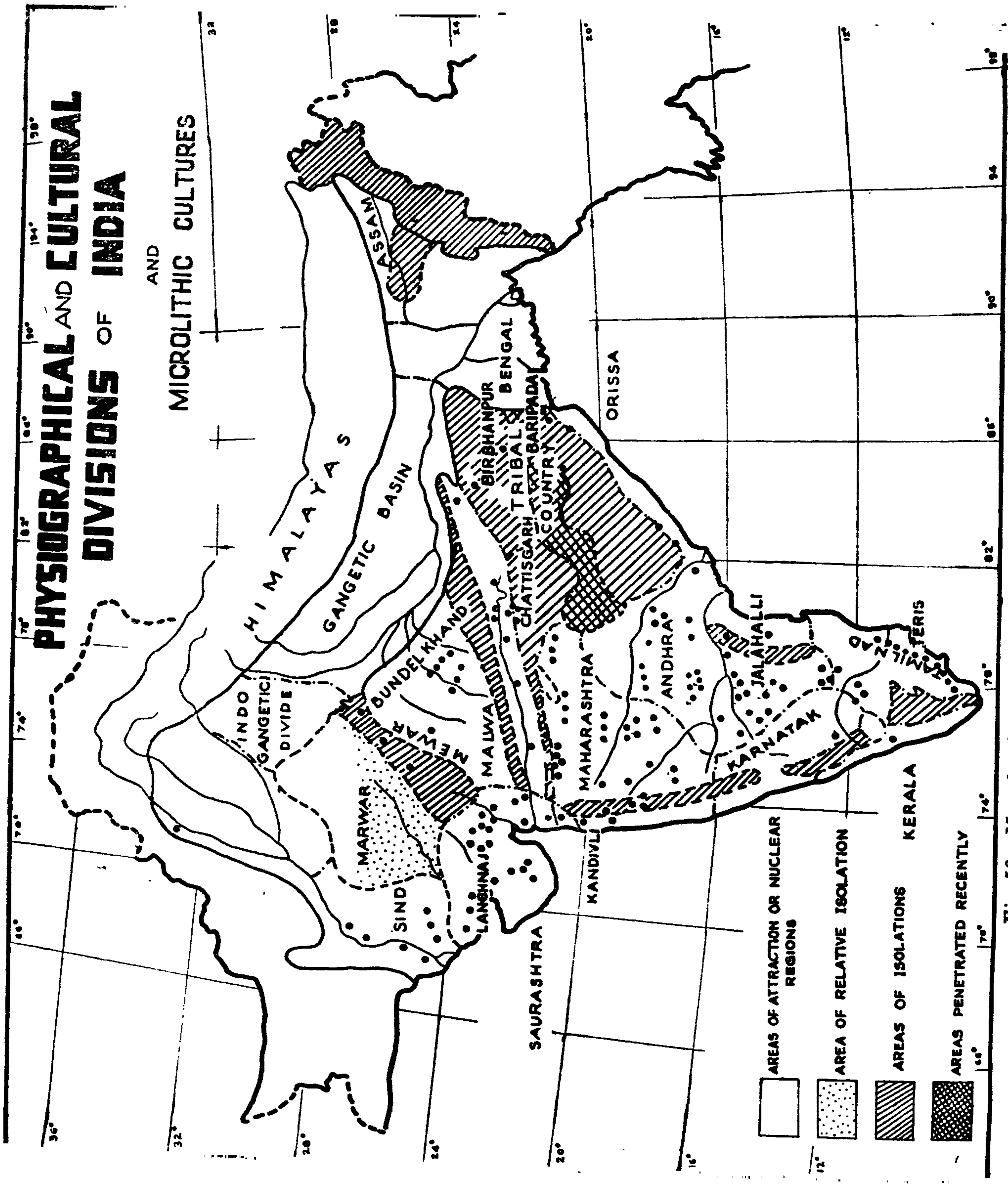


Fig. 56. Map showing the distribution of Microlithic Cultures in India.

Birbhanpur), by Murray[33] from Hartopa in Singhbhum in 1940, by Chakaldar[34] in Bankura District in 1952 and again by Krishnaswami in 1959-60 and by Ray[35] near Bongara in Manbhum District in 1954.

Thus three out of four divisions of Chota Nagpur viz. Singhbhum, Manbhum, Ranchi, except Palmau, and the region bordering on West Bengal and Orissa have yielded microliths.[36]

Everywhere the sites are situated on the old river terraces and plateaus and away from the present river valleys. These are lightly forested now, and were possibly so when the microlithic people inhabited the area. At present these are the homes of a number of aboriginal tribes, such as the Santals and Uraons. Hence the Chota Nagpur plateau is of particular importance in understanding the Mesolithic problem in this part of India. How old are these microliths ? Have they anything to do with the present tribes or their ancestors ? No large scale work has ever been attempted in this region. However, one small excavation by Lal and earlier observation by Anderson give some idea of the antiquity of microliths.

Anderson noticed chert flakes in river sections on the Sanjai and its tributaries. These were found according to him on the top of gravel deposit which overlies whitish clay or schist. Whether this gravel is old, that is Pleistocene, or comparatively recent is difficult to say without first hand examination. So also about the tools. Elsewhere microliths occur in the latest gravel deposits. There is also a possiblity that these tools which look like microliths are older, belonging to Middle Palaeolithic complex. For 18 ft. of reddish clay over lay the gravel, and hence the tools if not plastered on with the gravel as a rewash, but really *in situ* ,should be considerably old. And as Dani has rightly noted, suggest different environmental and climatic conditions than those obtaining today. The illustrations of the tools do not convey anything.

Birbhanpur

The site of Birbhanpur is near the Durgapur railway station on the bank of the Damodar river in Burdwan District, West Bengal.[37] It was discovered[38] by Shri Lal and excavated on a very small scale during 1954 and 1957. " The site is fairly extensive, bgeinning from about a furlong north of Birbhanpur, it continues beyond the railway line on the north. On the east it is roughly bounded by the road between the Durgapur railway-station and Birbhanpur and it continues well into the jungle of Sal tree (*Shorea robusta*) on the west." [37a]

33. Murray, E. F. O., in *J.A.S.B.*, Vol. VI, pp. 79-104.
34. Chakladar, *Man in India*, Vol. XXXI, 1952, pp. 124-64.
35. Ray, G. S., *op. cit.*, Vol. XXXIV, 1954, pp. 16-9.
36. Nadiha in West Bengal proper has given a few microliths, *A.I.*, No. 14, 1958, p. 16.
37. Lal, B. B., *A.I.*, No. 14, (1958), pp. 1-48.

37*a*. Many more sites exist in the Kunoor and Ajay valleys which run through the Burdwan and Birbhum Districts. (See Fig. 115 A). The topography is identical. The writer had an occasion to see some of these owing to the kindness of Shri P. C. Dasgupta, Director of Archaeology, West Bengal.

38. It appears that this is the same site which was previously discovered by N. G. Majumdar in 1937 ; *A.S.I.A.R.*, 1937.

Site (*See Fig. 57*)

The site is situated on one of the middle terraces of the Damodar river. Over the basal decayed sandstone is a thick layer of mottled silty sand, believed to be weathering *in situ* of the underlying rock. The latter—sandy silt is capped by lateritic gravel and stone fragments in a silty matrix which became consolidated. The top of this layer is uneven. It probably formed the land surface over which the microlithic man lived. For the microliths were mainly found at this level and in the over lying earth mixed with quartz and haematite. This layer in its turn is covered by sandy light brown earth.

It has been inferred that the mirolithic man lived on an uneven surface consisting of many humps and depressions. The excavations were so small that it was not possible to get any plan of the house of this period. But a large number of post-holes were observed. It is possible that the plan would be circular in outline. Of course, the evidence for post-holes is very negligible.

Tools (*See Fig. 58*)

Because of the non-occurrence of the trapeze[39] and the triangle Birbhanpr microlithic industry is regarded as non-geometric. It includes :

(*i*) Irregular, free-flaked cores.
(*ii*) Fluted cores
(*iii*) Blades
(*iv*) Lunates
(*v*) Points
(*vi*) Borers
(*vii*) Scrapers
(*viii*) Burins.

The material is mostly milky quartz, though occasionally crystal, chert, chalcedony, quartzite and fossil wood are used.

Dr. B. B. LAL's geochronological studies indicate that the climate when the microlithic people occupied the site must have been comparatively dry and mild, after the last wet phase during which the laterite weathered, and dense forest existed in the region. This mild climatic phase was followed by a period of increasing aridity, and violent wind activity so that the habitation layers were covered with wind-blown sand.[39a]

Singrauli Basin—Mirzapur

The whole of the Kaimur range south of the Ganges is in a sense the extension of the highlands and forests of Bundelkhand and Baghelkhand. Here CARLLEYLE, COCKBURN, RIVETT-CARNC had discovered microliths and other stone implements in 1880s.[40] These and other subsequent finds by GORDON[41]

39. One surface specimen tentatively described as triangle and trapeze is really a lunate.

39a. This and the great antiquity of the tool bearing layer has been proved by further geochronological studies, *A.I.*, No. 17, 1961, p. 43.

40. BROWN, JOHN ALLEN, in *J.A.I.*, Vol. XVIII, 1889, pp. 185-86 and SMITH, VINCENT in *I.A.*, Vol. XXXV, 1906, pp. 185-95.

41. GORDON, *Man*, 1938, p. 22.

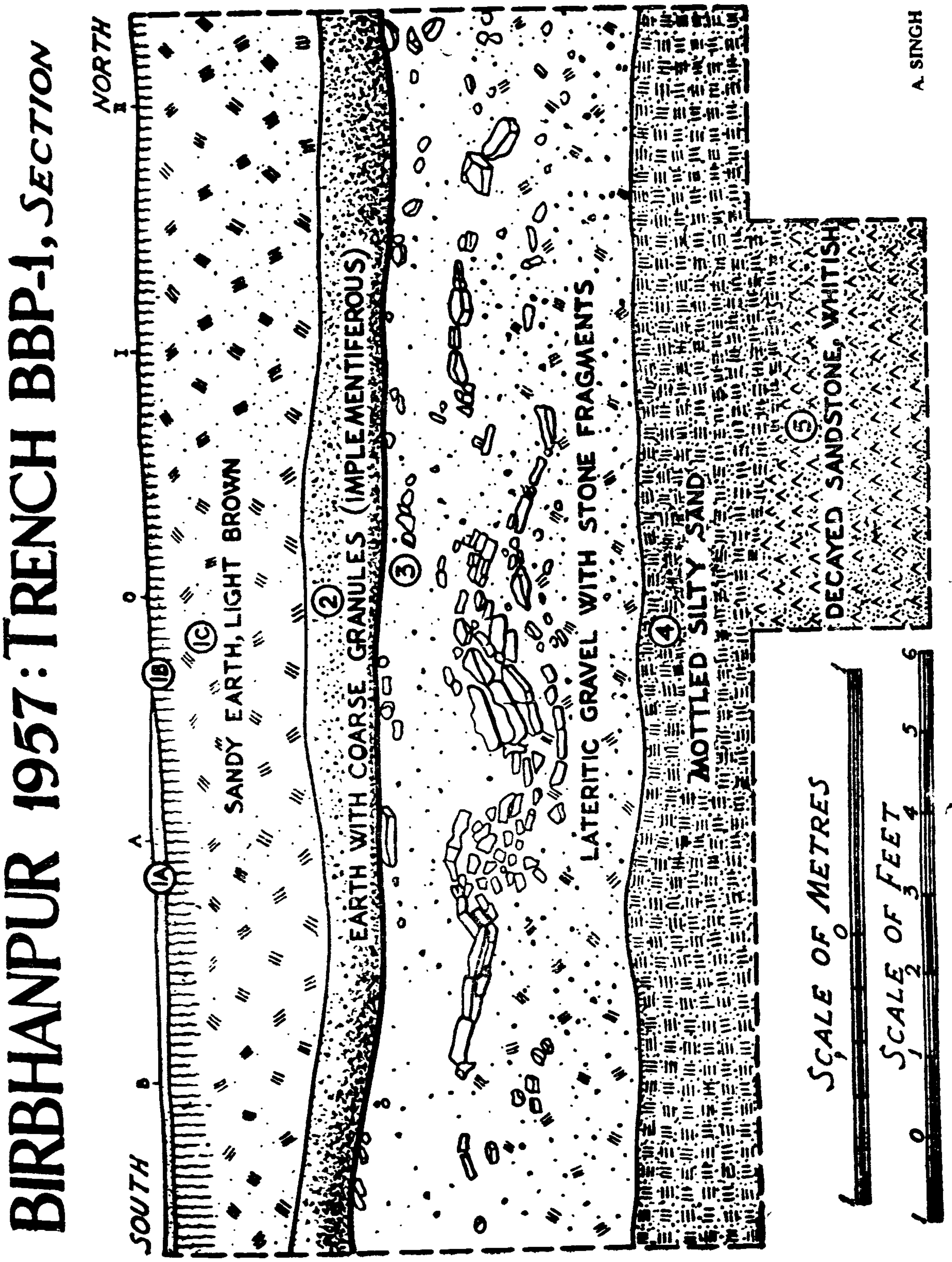

BIRBHANPUR 1957: TRENCH BBP-1, SECTION
SOUTH
NORTH
1A
1B
1C
SANDY EARTH, LIGHT BROWN
2
EARTH WITH COARSE GRANULES (IMPLEMENTIFEROUS)
3
LATERITIC GRAVEL WITH STONE FRAGMENTS
4
MOTTLED SILTY SAND
5
DECAYED SANDSTONE, WHITISH
SCALE OF METRES
0
1
SCALE OF FEET
0
1
2
3
4
5
6
A. SINGH

FIG. 4

Fig. 57.

and others have been from the surface and from cave floors. Without a proper excavation, not much use can be made of these reports. Hence a brief reference is made to a comparatively recent work[42] in the Singrauli Basin in the district of Mirzapur. Here the microliths occur about four feet below the Upper Alluvium along the southern bank of Balia Nadi near Kota. It is predominantly of limpid quartz which is easily available in the vicinity. "It is non-geometric denoted by parallel-sided blades, lunates and points. Only a few tools are either finished or retouched." It may be a degenerate, late Upper Palaeolithic blade industry, ascribable to an early Mesolithic period, when a gradual dryness came over the area after the end of the Palaeolithic period.

Of particular interest is a paragraph in CARLLEYLE's notes quoted by SMITH.[43]

> "I also excavated several prehistoric *tumuli* or grave-mounds, in the valleys of the Vindhya range. In these mounds I found whole skeletons, but in such a friable condition that not a single entire bone could be got out. I also discovered rude earthenware vessels and fragments of pottery in the same mounds, along with small stone implements and numerous flakes. Among the smaller stone implements found in the mounds there were several of exactly the same peculiar forms and types as those found in the caves, leading to the conclusion that the men buried in the mounds were of the same race as the men of the caves. In six different mounds which I excavated I did not find a single bit of metal of any kind."

This shows how promising the whole region is for understanding the Mesolithic and other Stone Age cultures and what little work has been done in the last 80 years to solve these!

Orissa

In Orissa proper, so far microliths have been reported from the districts of Mayurbhanj, Keonjhar and Sundergarh.[44] And these have completely belied the observations based on insufficient evidence that microliths were not found away from the copper seams.[45] Normally they occur on surface and the basin of rivers. The latter aspect is important and will be commented on later. Secondly a small excavation by Shri B. K. THAPAR at a site near Baripada,[45a] Mayurbhanj yielded microliths exactly of the types found by Dr. MOHAPATRA on the surface, in a layer below the ground ones. This definitely indicates the antiquity of microliths in Orissa.

Andhra

Further south in Andhra a large number of discoveries have been made since the last century. Of these the most important are the notices by FOOTE[46]

42. KRISHNASWAMI, V. D. and SOUNDARARAJAN, K. V., in *A.I.*, No. 7, 1951, p. 59.
43. SMITH, *op. cit.*, p. 187.
44. MOHAPATRA, G. C., *op. cit.*, p. 260.
45. GORDON in *Man*, 1938, p. 22.
45a. A later excavation in May 1962 yielded similar results, see *I.A.R.*, 1961-62.
46. FOOTE, *Indian Prehistoric and Protohistoric Antiquities.*

and Cammiade[47] supplemented by later observers like Subbarao,[48] Soundara Rajan[49] and Isaac.[50] Not only the range is widened, but more specific information is now available regarding the manner in which microliths occur and their typological nature.

Mode of Occurrence

Briefly, microliths are found on surface, generally on high ground, on the river banks in the top-most deposits of fine loose sandy gravel, in and around granitoid rock shelters as well as in the vicinity of caves in the limestone and sandstone formations in Kurnool District. Some sites overlook a waterfall and it is quite conceivable that these were the temporary camps of microlithic people.

Nature of microliths

It also appears that as in Maharashtra, Mysore and Central India we can classify the microliths into (*a*) true microliths of Mesolithic type and period and (*b*) Short parallel-sided blades etc. To the former belong microliths which Subbarao found in his excavations at Sangankallu in Phase I and those discovered by Soundara Rajan at Nagarjunakonda in Guntur District, by Isaac and Cammiade in Kurnool and elsewhere, for instance, near Pondicherry[51] in the red soil away from the sea coast. Of course, with more systematic work, further clarification will follow.

Thus at present it is difficult to say how these microliths, though mostly from the surface, are related to those from the *teris* of South India. For the present we have a classification of Cammiade's vast collection[52] into geometric and non-geometric microliths, though as yet a well-defined stratigraphical correlation alludes us. The industry comprises parallel-sided blades, lunates, triangles, trapezes, scrapers, backed blades and burins.

Tinnevelly (See Fig. 59)

In the extreme south, Foote,[53] again, was the first to report the existence of microliths. Work of some importance began sixty years later when Aiyappan wrote on the Sawyerpuram collection in 1945.[54] Though definitive results are not yet available for want of larger collections and prolonged geological and pedological investigations, still Zeuner's brief inspection of the area and analysis of the soil gives us an interesting (likely) picture of the climatic and geographical conditions of the area and the typology of the tools.[55]

47. Cammiade, *op. cit.*, and Cammiade and Burkitt in *Antiquity*, No. IV, 1930, p. 338.

48. *Stone Age Cultures of Bellary*, Poona, 1948, and *Prehistoric and Early Historie Bellary*, Ph.D. thesis, 1949, University of Bombay and Deccan College Libraries.

49. Soundara Rajan, in *A.I.*, No. 14, 1958, pp. 50, and 90-3.

50. Isaac, *The Stone Age Cultures of Kurnool*, Ph.D. thesis in the University of Poona and Deccan College Libraries, 1960.

51. See, Zeuner, F. E. and Allchin, Bridget in *A.I.*, No. 12, 1956, pp. 4-20. The writer got a few microliths from the late Prof. Joveau-Dubreuil as far as back 1940. And his examination later of the area makes him feel that it is like the Ṭeri area.

52. Cammiade and Burkitt, *op. cit.*, p. 338.

53. Foote, *op. cit.*, p. 50.

54. Aiyappan, A., in *Spolia Zeylanica*, Vol. XXIV, 1945, pp. 145-54.

55. Zeuner, F. E. and Allchin, Bridget, in *A.I.*, No. 12, 1956, pp. 4-20.

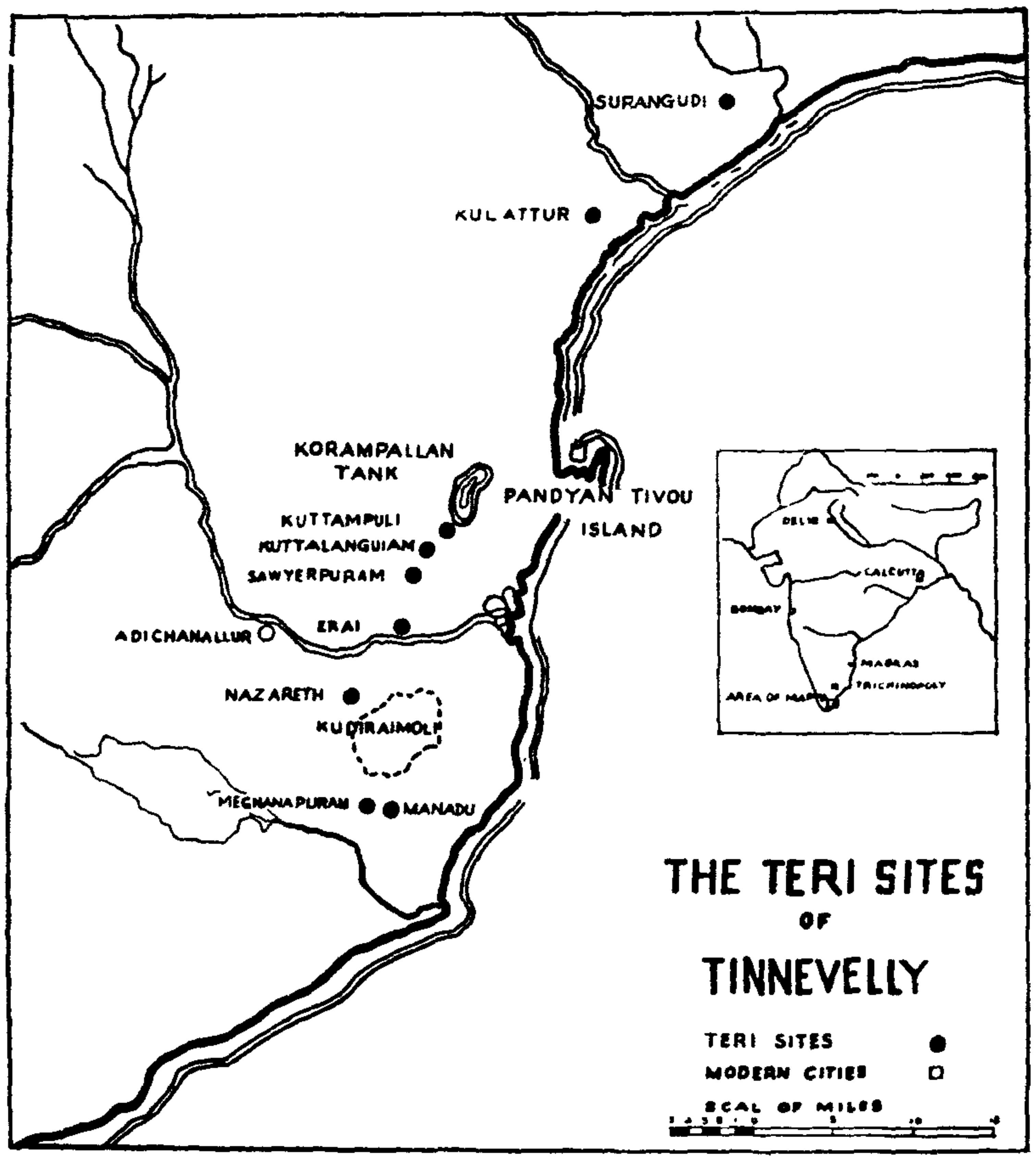


Fig. 59.

The area in question is the very tip of the Indian peninsula, the extreme southern point, included at present in Tiruchendur Taluk, in Tinnevelly District. It is thus slightly south-west of Tiruchirapalli (Trichinopoly) and comprises a part of the ancient Pandyan kingdom and the famous Tambraparni river.

Sites

The eleven sites—Megnanapuram, Kuttampuli, Kuthankuli, Sawyarpuram, Kattalankulam, Kullatur, Puttan Taruvai and four others—are situated to the south and north of the river Tambrapani, where it meets the sea but slightly away from the coast. They are known as *Teri* sites, because these are associated with fossil red sand-dunes locally called *teris*. These not only form a conspicuous feature of the region, but relate the story of the climatic and other changes which the region has witnessed in the last 5,000 years or so.

Past climate

When the microlithic man first inhabited the area, the sea level was higher by about 20 to 30 feet than what it is today. This was due to a drier climatic phase, probably all over the world. Locally this led to the formation of sand-dunes—the first *teris* and lagoons, owing to increased wind activity. It was on these *teris* that the people sat. Afterwards the climate changed and weathering occurred. This made the dunes to get fixed—reddish and cemented. Then began the recent or sub-recent phase. Wind activity re-started and fresh *teris* and lagoons began to be formed.

It is in the old reddish *teris* (fossil dunes) towards the top, that most of the microliths are found. It is not lateritic, " though as red as laterite," but belongs to what ZEUNER calls, " ***rotlehm*** group of KUBIENA."[56]

Raw material

The material of which the microliths are made is chert, silicified wood and limpid quartz, which FOOTE had observed were foreign to this part of the country. All except those from Kulattur are stained with red hydrated ferric oxide. This indicates that the tools belong to the fossil wind-borne sand-dunes, which are being eroded. Hence ZEUNER calls this " the Tinnevelly Teri industry." Its most distintive feature is the presence of pressure-flaked bifacial points. These do not occur elsewhere in India, but are found in small numbers in Ceylon (which is just across the narrow sea channel).

*Tool types (**See Fig. 58**)*

The rest of the industry comprises: 1. Blade-flakes, 2. Blades (simple unretouched), 3. Backed Blades, 4. Obliquely blunted blades, 5. Scrapers— Hollow, Concave, Side, End, and Thumb-nail, 6. Discoids, 7. Simple (unretouched) Points, 8. Asymmetrical Points, 9. Unifacial Points, 10. Bifacial Points, 11. Lunates, 12. Transverse Arrowheads, 13. Triangles, 14. Chopping Tools and 15. Cores.

Among these 15 tool types including the cores, the lunates preponderate, as is usual in pure microlithic sites. Of course, lunates so often pass off into asymmetrical points and transverse arrowheads that their number would always vary accordingly as one defines each specimen, which is not so easy owing to the various transitional shapes. But on the whole, the number of lunates is decidedly larger.

On the ground of staining, it may also be possible to say that the tools from Kulattur, for instance, are comparatively later, because they are almost completely without the usual red stain.

Typologically, again, this is the only site which has yielded four triangles —a form which would distinguish the industry as "Geometric." Thus on these two grounds the *Teri* industry will have two phases. The older one belonging to a fossil *teri* and hence of some geological antiquity. Provisionally ZEUNER dates it to 4000 B.C. with a suggestion that further geological research may push it back into the Pleistocene.

Fig. 58

This figures illustrates (1) microliths from Birbhanpur (1-16) and (2) from the *Teris* of South India.

(1) *Birbhanpur*

1-5, 9	**Lunates, asymmetrical points. No. 8 could also be called a " transverse arrowhead."**
6, 7, 8	**Symmetrical Points**
10	**Borer**
11-12	**Parallel-sided blades**
14	**Scraper**
15-16	**Fluted cores**

56. ZEUNER, *op. cit.*, p. 7.

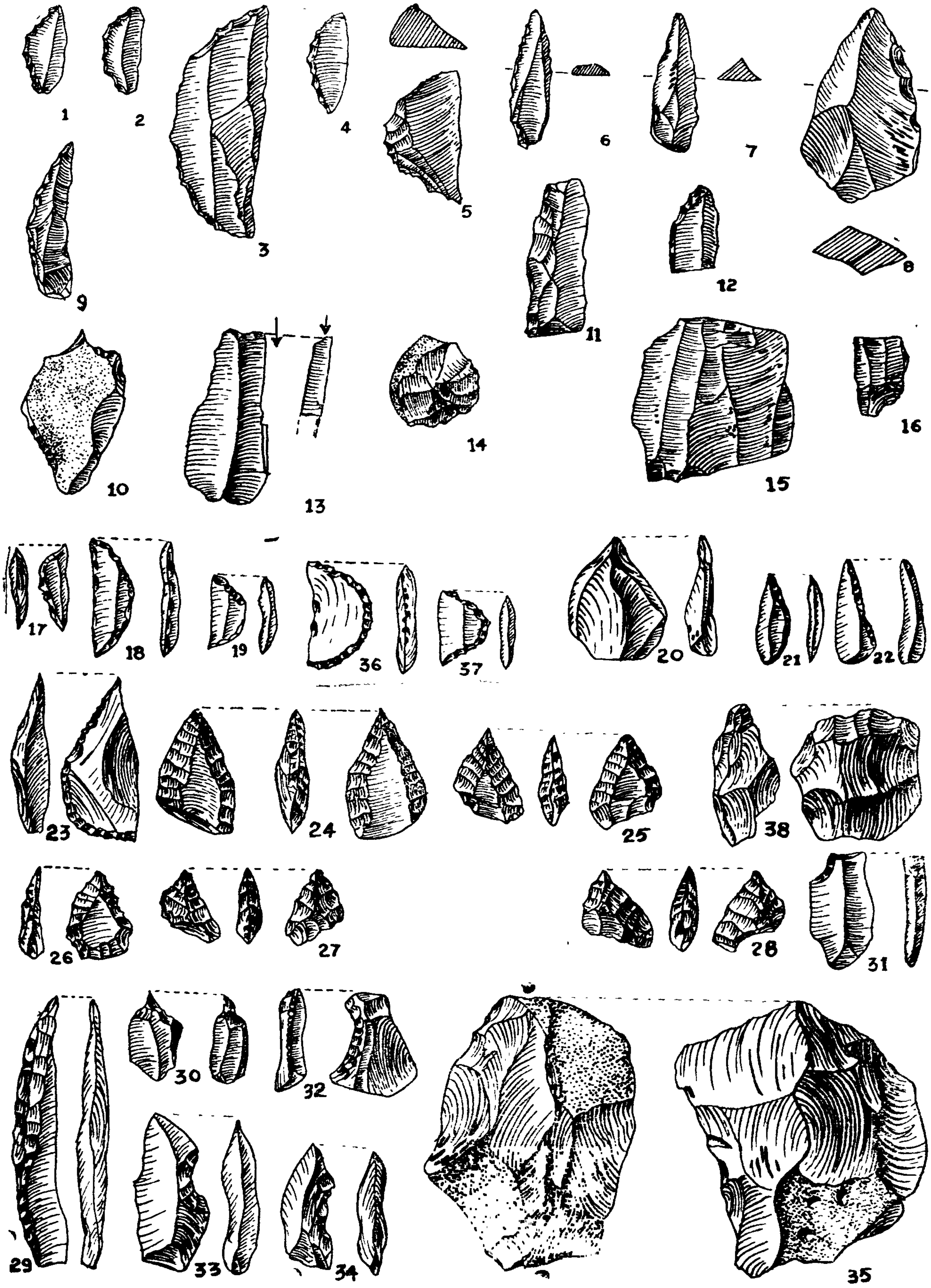


Fig. 58. Microliths from Birbhanpur (1-16) and Tinnevelly (17-35).

(2) *Teris*

17-19	Lunates
20	Points
21-22	Asymmetrical points
23	
24-28	Bifacial points
29	Obliquely blunted blade
30	Borer
31	
32-34	Concave scrapers
35	Core or chopper (?)
36-37	Semi-circular flakes with fully retouched arcs. These are described as transverse " arrowheads."

Mysore

A large number of microlithic sites have been reported from Mysore State, particularly from the districts of Chitaldurg, Bellary, etc. since 1895. These districts are studded with granite rocks. Very often the microliths are found on the bare surface of these hills or hillocks and as such are without any association. But at Jalahalli there is a narrow valley about a quarter of a mile wide. The granite hills at places contain intrusive veins of milky quartz and rock crystals. It was here that TODD discovered some microliths on the surface. But some were found by him below a layer of black soil in a reddish soil horizon described by him as ' pelletic laterite." SESHADRI has argued that this may not be true laterite," " but the horizon should be of a colluvial nature and containing " pelletic laterite " formed elsewhere and mixed with decomposed fragments of local granites."[57] The implementiferrous horizon seems to be the top of the red layer or sometime the layer itself.

Types of microliths

Dr. SESHADRI groups this and other collections on typological basis into :

(*i*) Jalahalli microlithic industry with a preponderance of crescents, points and arrow-heads, indicating a hunting economy and environment.

(*ii*) Brahmagiri microlithic industry consisting primarily of parallel-sided flakes, and Gravettian-like penknife blades, implying a semi-urban culture in which arrow-head, crescent etc. are absent.

There is also a third group, formed by Kibbanahalli in which there are three or or four types of scrapers, blades, and highly finished lunates.

Subsequent work elsewhere in India has shown that Brahmagiri microlithic industry indeed forms a part of the vast Chalcolithic culture-complex, which was mostly of a peasant-village type, but had attained an urban stage in Sind, the Panjab and Saurashtra. Further, while this peasant stage can be dated to 1800 B.C., the purely geometric industry cannot be brought to that date. Probably it is early and truly Mesolithic.

57. SESHADRI, M., *The Stone Using Cultures of Pre-Historic and Proto-Historic Mysore*, London (1956), p. 29,

North Karnatak

Further up in Northern Karnatak the conditions are as in South-eastern India. Genuine microliths can be distinguished from blades of the Chalcolithic culture. Though both occur together in several sites along the river banks, the former occur exclusively, either in rock-shelter and caves like the Shidlapadi near Badami,[58] and the foot-hills near Bilgi and also in the top, loose deposits capping the old alluvium. The material is generally carnelian and such varieties of chalcedony, though occasionally chert and jasper which formed the chief source of the Middle Palaeolithic people is also there. No site is so far excavated and so no idea can be had of the age of the microliths.

Maharashtra

The position in Maharashtra is not much different. Natural caves are few. However, large openings may be seen at the junction of the two lava flows, for instance in the steep sides of the hills, about eight miles south of Sangamner. But hill slopes, for instance, Dighi[59] near Poona on the Alandi road, those near the University and the Fergusson College[60] and the Ellora[61] and Karla[62] caves are strewn with microliths. At one time, it is difficult to say when or whether these were all workshops of the microlithic man. Veins of agate, chalcedony and quartz criss-cross these basaltic hills and plateaus. Raw material is thus plentiful. It is for us to decide what are tools and what are natural chips. Ninety-nine per cent of any collection will be found to be full of rejects, in which may be found even what are called "bored flakes." These are either natural or artificially removed flakes from cores with natural (full or incomplete) cavities. No evidence is so far available that such bored flakes were ever used by man as ornaments and the like. Cliffs along the rivers Godavari and Pravara right from Nasik and Vite in the west to Paithan in the east, in Nasik and Ahmadnagar Districts were covered during the last aggradation phase with a loose kankary gravel.[63] These abound in microliths made principally on milky chalcedony and agate. With a little experience one can easily distinguish these microliths from those of the Chalcolithic period. The former includes short fluted and irregular cores, lunates (some very large), small parallel-sided and one-edged blades, scrapers of several types, and a large number of chips. On the whole these are thicker than the blades etc. of the Chalcolithic facies, whereas those of the still earlier period are still more thick and very often patinated.

It has not yet been possible to determine the age of this last aggradation which has been a feature of all the rivers in Andhra, Karnatak, Maharashtra, Central India, Saurashtra and Rajputana. If, the evidence from the Singrauli basin[64] and the recent one from Khandesh[65] be any guide, then these microliths should be of considerable antiquity.

58. *I.A.R.*, 1955-56, p. 5.

59. Deccan College collection and earlier one by GORDON.

60. Deccan College and other private collections in Poona. There are strewn with Middle Stone Age tools.

61. Deccan College collection and earlier one by CODRINGTON and GORDON, *Man*, 1938, p. 22.

62. *I.A.R.*, 1956-57, p. 79.

63. SANKALIA and others, *From History to Prehistory at Nevasa*, p. 528. It is possible that this very thin sandy deposit is due to a flood of an unprecedented nature, which while retreating has left such a thin cover on the older silt. Similar phenomenon has been reported from Vidarbha and Madhya Pradesh which experienced floods not known in living memory in the first-second week of September 1961, and while receding have left the fertile lands in these regions with sandy deposits.

64. Above

65. *I.A.R.*, 1959-60, p. 38.

Salsette Island, Bombay

In the Konkan the Salsette island is so far investigated to some extent. Whether we agree with TODD that Kandivli Microlithic culture marks the end of rich cultural sequence beginning with the Early Palaeolithic or not, there is no doubt that this and other sites along the coast and the Thana creek and along the banks of the rivers like the Ulhas in the north and the Amba in the south of Bombay speak of a wide-spread habitation during the microlithic phase.[66] These people inhabited slightly higher elevated grounds—usually rocks or hillocks and avoided the thicker jungle in the interior. It is likely that they preferred the region because it grows abundance of bananas and coconuts and abounds in fish and fowl. Raw material could be had in the river gravels as well as in the veins of chert, jasper etc. which abound in these hills.

Tools (See Fig. 60)

Hitherto no remains of their temporary camps have been discovered, except microliths. These also contain a few heavier tools like the mace-head or digging weight, chopper, besides a purely geometric microlithic industry. It may, therefore, be divided into an earlier and a later series. The former may be derived from the blade and burin industry, dependent primarily on hunting, while the latter along with geometric forms and heavier tools like the " mace-head " may point towards a food-producing stage. TODD lists the following groups of tools. Microliths (obliquely and wholly blunted, lunates, triangles, trapezes, trapezoids, drills), five types of cores and scrapers, mace-heads and axes.

Fig. 60

This figure illustrates (*a*) microliths from Jabalpur (1-14) and (*b*) from the Bombay area (15-31) described by the GORDON and TODD respectively.

(1) *Jabalpur*

1-5	Triangles
6	Trapeze
7-18	Lunates and asymmetrical points
9, 18	Awl or Borer
10	Symmetrical Point
14	Long blade
15-16	End scrapers

(2) *Bombay Area*

17-19	Triangles
20	Trapeze used as " Transverse arrowhead "
21-22	Lunates on asymmetrical Points
24-25	Awls, Borers or Drills
27, 30	Scrapers
26	Burin
31	Micro-burin
32	Ring stone or mace-head

66. TODD, K. R. U. in *A.I.*, No. 6, 1950, pp. 1-16.

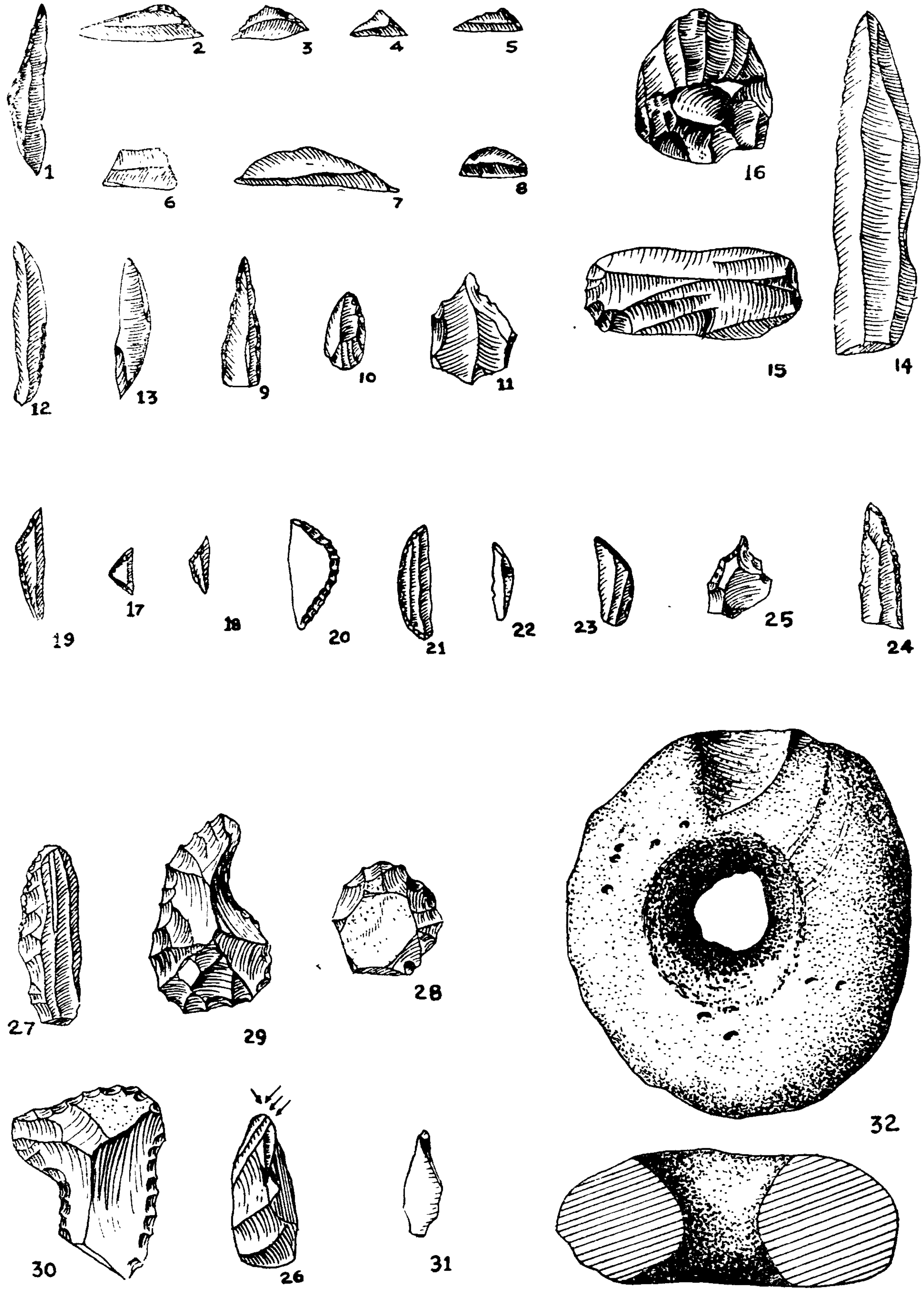


Fig. 60. Microliths from Jabalpur (1-16) and Bombay (17-32) (*after Gordon and Todd*).

Gujarat

Gujarat has three different physiographical divisions. Southern Gujarat which is in fact a continuation of Konkan is partly formed by recent alluvium of the rivers and the subsidence in sea level, whereas the eastern portion is hilly and forested and is indeed a part of the Central Indian highlands. Northern Gujarat is supposed to begin from Ahmedabad and continue up to the foothills of the Arvallis. For all this region is covered by masses of wind-blown sand which petrological analysis has shown to be originally river silt,[67] brought down by the erosion of the Aravallis. However, this feature extends up to Baroda and a little further south.

Saurashtra constitutes the third division. It is like the Deccan Maharashtra, mostly a basaltic formation with older geological rocks exposed in the west-north-west around Dwarka, the whole island (or peninsula which was later) ringed by a recent coastal belt.

Now in all these three divisions Robert Bruce FOOTE[68] had discovered microliths. To these discoveries a number of new sites were added by the First Gujarat Expedition, mostly from Northern Gujarat. Some more in the Mahi Valley[69] and in the Banas Valley[70] have been brought to light by Dr. SUBBARAO and his colleagues in the Baroda University. A number of surface discoveries have been reported from Saurashtra.

During all this new work, microliths have been found in a stratified context on three or four occasions. Of these the most important are the excavations at Langhnaj[71], a railway station on the meter gauge line between Ambaliyasan and Vijapur in Mehsana District.

Langhnaj (See Fig. 60A-61 and Pls. V-VII)

Langhnaj is not a solitary site, an oasis, but one of the hundreds (SUBBARAO lists over 80) in the sandy undulating alluvial plains of Northern and Central Gujarat.[72] The topography is certainly different from what one sees in Kurnool, in the heart of the old land mass. Here are miles and miles of flat, sandy stretches where suddenly one finds two or three small hillocks of the same material enclose an indundation lake, which keeps water for almost ten months in a year. The tops and slopes of these small hillocks which were lightly wooded are strewn with microliths. These, as well as the river banks, were the resorts of the microlithic people.

A series of small excavations were here conducted by the writer between 1941-49, and again by Dr. SUBBARAO in 1953. Stratification is indeed difficult to discern in these masses of wind blown sand. Initially two main layers were detected. The top one of about 3 feet depth and dark brown in colour and a

67. See, KELKAR in SANKALIA, *Investigations*, pp. 312-3.

68. FOOTE, *op. cit.*, and classified list by SANKALIA, H. D. in *Glory that was Gurjaradesa*, Part I, 1943, pp. 34-40.

69. *Journal M. S. University*, Vol. I, 1952, pp. 34-72.

70. An account of this is not yet published.

71. For the latest review, see, SANKALIA, H. D. in *JGRS*, Vol. XVIII, 1956, pp. 275-84, and references to earlier work therein.

72. For a distribution of these mounds and sites see SANKALIA, *Investigations*, Map. V Fig. 60A.

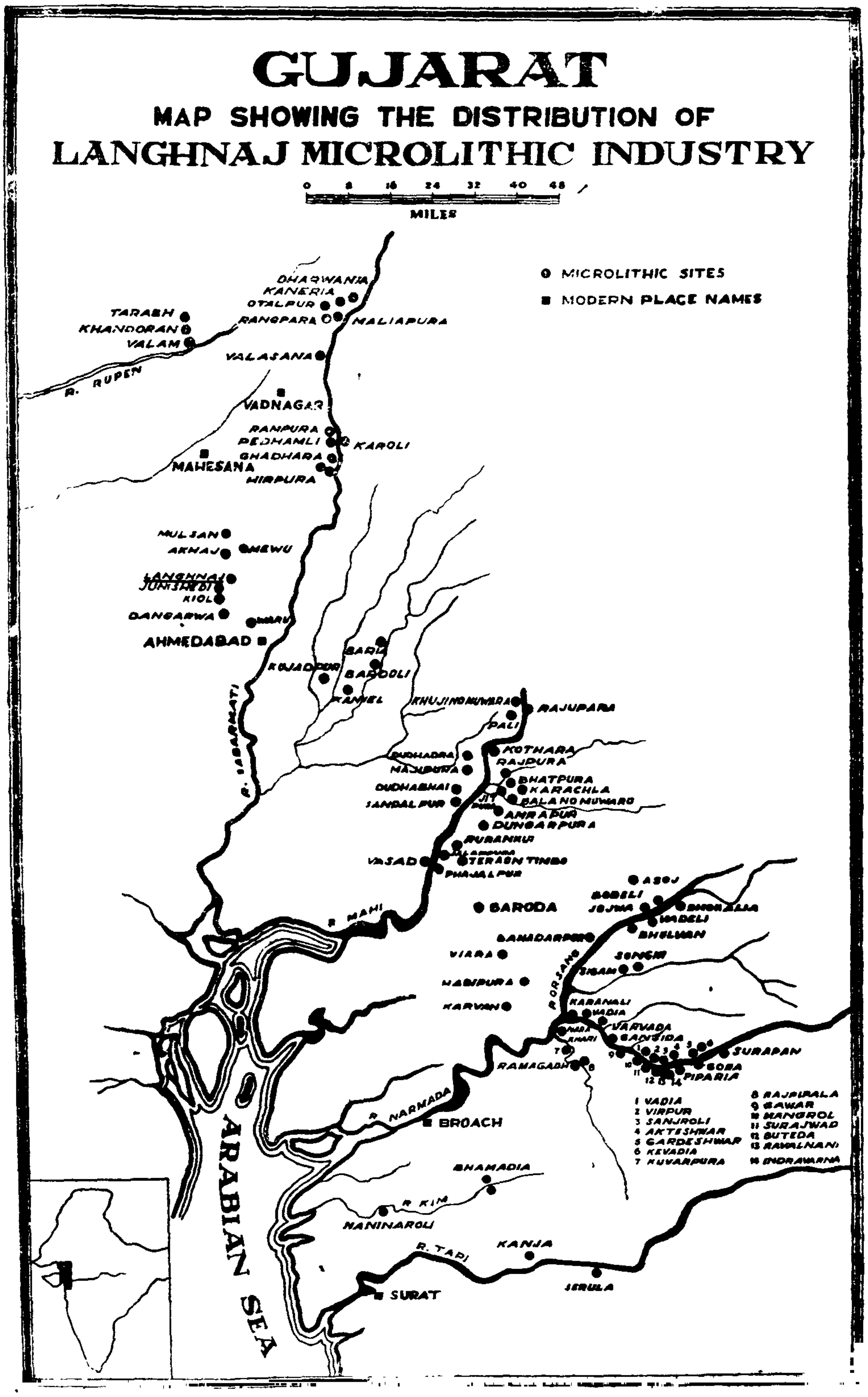

GUJARAT
MAP SHOWING THE DISTRIBUTION OF
LANGHNAJ MICROLITHIC INDUSTRY
0 8 16 24 32 40 48
MILES
MICROLITHIC SITES
MODERN PLACE NAMES
R. RUPEN
VALAM
VALASANA
NALIAPURA
VADNAGAR
KAROLI
MAHESANA
MIRPURA
LANGHNAJ
AHMEDABAD
R. SABARMATI
RAJUPARA
KOTHARA
VASAD
BARODA
R. MAHI
ORSANG
SURAPAN
R. NARMADA
BROACH
R. KIM
R. TAPI
KANJA
SURAT
ARABIAN SEA

Fig. 60A

lower one of equal thickness, but of light brown earth and gradually merging with the main deposit below. Later, a more skilful effort showed that there were probably four layers (*see Fig. 62a, 63a* and pl. *V*). This was confirmed to some

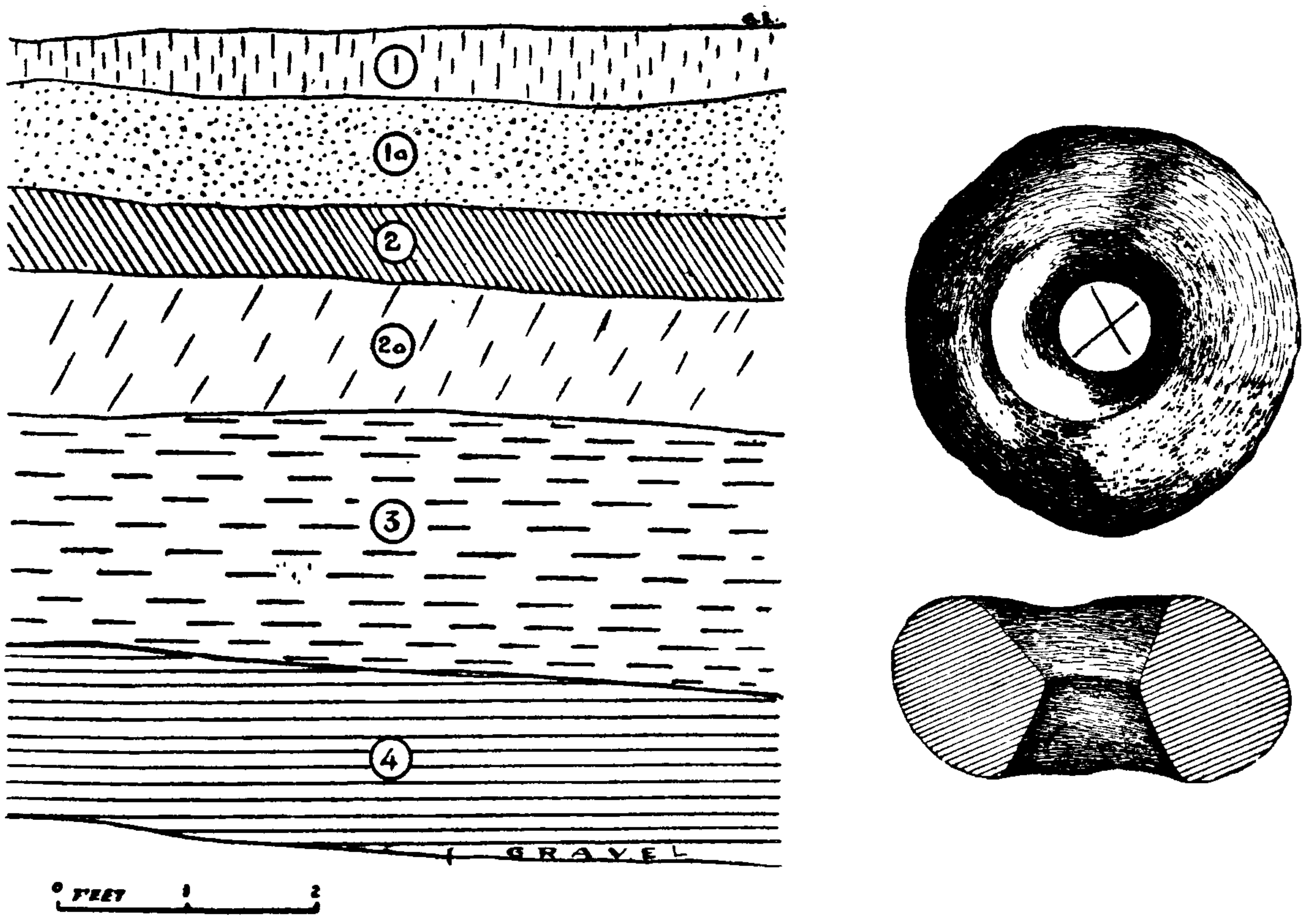


Fig. 62. (*a*) Section Trench at Langhnaj, Northern Gujarat.
(*b*) Mace-head from Langhnaj.

extent when Professor ZEUNER analyzed the soil samples chemically. Briefly, three main layers or cultural zones exist as follows :—

Section as demarcated on 28-1-47	*Zeuner's analysis on* 15-1-49	*Cultural Zones*
Layers 1, 1a, 2, 2a, Dark brown sand	Sand 1 ft.-3 ft.	Priod III. Modern pottery, iron and microliths.
Layer 3 upper half	Sand 3 ft.-4 ft.	Period II. Old pottery, microliths and mace-head or ring-stone.
Layer 3 lower half	Buried soil.	Period I. Pure microlithic culture with most of the human skeletons and animal remains like rhinoceros.
Layer 4 upper half	4 ft.-5 ft.	
Layer 4 lower half and below	Kankar and sands	

Prof. ZEUNER suggests that the sand dunes were formed when at the end of the dry phase (U) a slightly damper phase had followed, which in its turn was succeeded by a drier phase. It was at this phase—sometime in the Late Pleistocene or early Holocene—that " more or less isolated dunes were blown over the land surface." A soil developed on these dunes.

Past Climate

The climate was slightly wetter so that large inundation lakes were formed between the hollows of the dunes. A nomadic, hunting people lived on these mounds and along the river banks. The industry[72] consisting of blades, lunates, trapezes, triangles, scrapers, points (symmetrical and asymmetrical) and a few burins and fluted as well as amorphous cores may be described as geometric, but is on the whole coarse and crude, though the material is chert, agate, carnelian and only occasionally quartz. Heavy tools so far are very few; only one mace-head or weight of digging stick of quartzite was found in a comparatively later deposit (Period II, *Fig. 62b* and pl. *VII*) in the excavation along with a few potsherds. A discovery of unusual interest by ZEUNER[73] who examined the huge rhinoceros shouldered blade was the use of this blade as an anvil for manufacturing microliths. No less than eight artificial pits occur on its surface. (*Fig. 65* and pl. *VII*).

With these, particular by asymmetrical points which could be used as barbs and arrowheads the men hunted rhinoceros (*Rhinoceros unicornis* L), hog deer (*Hyelaphus porcimus* Zimm), Indian buffalo, Nilgai, Antelope (*Boselaphus tragocamelus* Pall), Black Buck (*Antelope Cervicapra* Linn and dog. All these, including the dog and the buffalo, according to Prof. ZEUNER's study seem to be wild. The fauna is thus of games, and the people, primarily hunters and fishers (as besides animal bones, remains of fish vertebra and tortoise shell have been found). Shells of dentalium and of an unidentified material but of flat disc shape were used as decoration. (*Fig. 65* and pl. *VII*).

Along with microliths and a large number of bones and a negligible quantity of pottery, about 13 human skeletons have so far been found. These are of a fairly tall, thin, dolicocephalic people, with a slight prognathism.

In spite of ZEUNER's preliminary geochronological studies and of animal remains, no absolute date can be had for the Langhnaj culture. SUBBARAO's excavation at Baroda[74] indicate an upper limit, not later than 500 B.C. Since microliths of Langhnaj type were also found in the lowest stratum of river gravel below the earliest deposit of the Indus Civilization at Rangpur[75] and also at Rojadi in Saurashtra it may also be argued that the Langhnaj Microlithic Industry is at least of equal antiquity if not still older, that is earlier than 2500 B.C.

73. ZEUNER, F. E. in *Man*, Vol. LII, 1952, pp. 129-31.
74. SUBBARAO, B., *Baroda Through the Ages*, Baroda, 1952, p. 13.
75. RAO, S. R., in *I.A.R.*, 1953-54, p. 7.

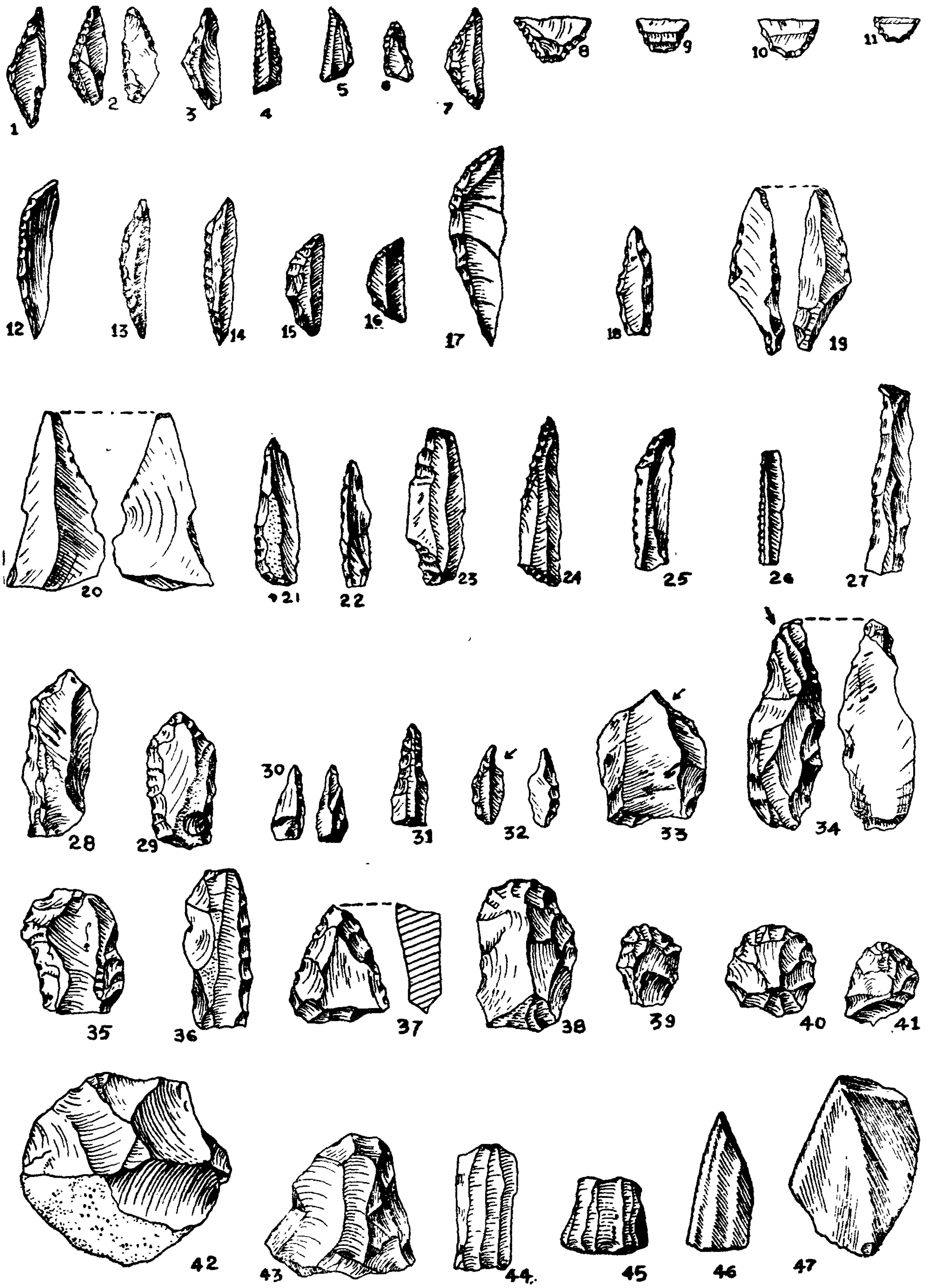


Fig. 65A. Microliths from Langhnaj.

Fig. 65A

This figure illustrates all the principal types of microliths found in the excavations at Langhnaj.

1-7	Different types of Triangles
8-11	Trapezes
12-17	Lunates and asymmetrical points
18, 30-31	Borers or Awls
19-20	Notched and partly retouched flake, which might have been used as an arrowhead
21-25	Partly bluntedback blades—retouched along the lower end only, and on the obliquely pointed side
26-27	Straight bluntedback and retouched edge
28-29	Blunted back and retouched edges giving a dull point
32-34	Burins (No. 33 from Akhaj)
35-41	Different types of Scrapers
42-45	Ordinary and fluted cores
46-47	Rubbers of haematite

A further indication of the age of the culture is given by the skeletons and beads of dentalium shells. To Dr. (Mrs.) KARVE certain physical features looked Negroid and she thought of Egyptian affinities. Dr. McCOWN who had worked on the Mt. Carmel skeletons with Sir ARTHUR KEITH thought that the skeletons might well be compared with the Natufian of Palestine. Of course, this view conveyed to the writer orally by Dr. McCOWN, when he visited India in 1958 and stayed at the Deccan College cannot be taken seriously until and unless a detalied comparison is attempted. However, Dr. (Mrs.) ERHARDT of Tübingen University after a very detailed and careful study of the 13 skeletons (including the one found by Dr. SUBBARAO in 1953) concludes[75a] :

> " Thus, if one compares the single traits and the combinations of traits with contemporary finds from similar areas, the result is small satisfaction. The small group of Langhnaj skeletons, which is, moreover, not unified should not mislead us into drawing any vast conclusions. According to my interpretation, from the available material, the Langhnaj skeletons mainly indicate traits which are characteristic for Mediterranids and Veddids, but which could also include other races."

In this connexion it is necessary to draw attention to the tusk-shaped dentalium shell beads which served as decoration for the body both at Langhnaj and at Mt. Carmel and Khirokitia in Cyprus.[76] The analogy may be regarded as quite fortuitous and without significance. However, there is no doubt that the dentalium shell had to be imported at Langhnaj from the sea coast and this distance is considerable, even if the nearest source be the Gulf of Cambay or the Arabian Sea.

75a. From an unpublished report.

76. These are considered by JAMES MELLAART in (*Dawn of Civilization*, p.44) as typical of the period (c. 6000 B.C.).

Though we may try to arrive at the date of the Langhnaj Microlithic Culture in this way, still until we know the exact nature of the microliths in the other two sub-divisions of Gujarat and their relation to the ecological setting, our conclusions must remain most tentative. Excavations of pure microlithic sites in these divisions or a much more extensive digging of microlithic levels in sites like Rangpur is necessary for a fuller knowledge. Langhnaj has shown us what promising field is there for knowing the nature of the primitive population of Northern Gujarat.

Malwa

No microliths had been reported from Western Malwa and Rajputana, though there was no reason why these should not be in these parts. In Malwa we are able to distinguish between the Chalcolithic blade industry and the typical microliths collected by KHATRI[77] from several sites in the valley of the Chambal and its tributaries. Since then a number of sites are being announced every year.[78] Besides the river valleys, the sandstone formations of the Western Vindhyan ranges contain numerous caves and rock-shelters. In addition to paintings and engravings,[79] these are strewn with microliths as are their counterpart in the east.

Madhya Pradesh

HUNTER[80] had excavated a rock-shelter in the Mahadev Hills, Panchmarhi, M.P. and GHOSH,[81] Bania Bari Cave near Panchmarhi. The former found microliths upto a depth of two feet or so along with a human skeleton. The latter's report is not yet fully published. What is important to note in this survey is the fact that the whole Vindhya range from west to east is not only a prolific source of microliths, but perhaps holds the key to the microlithic or mesolithic problem in Central India. Are the microliths the works of present primitive tribes or their ancestors who inhabited these sheltered hills and forests as refugees? Or are they very much older? Planned exploration followed by one or two full excavations should help to understand these problems.[81a]

Rajputana (See Fig. 66)

In Eastern Rajputana it is the hilly flanks which yield microliths as shown by the work of MISRA[82] and other observers.[83] These are rightly regarded as factory sites. So far, however, no habitation site has come to light.

Western Rajputana was completely blank. But here too MISRA[84] has found two sites in the Luni valley. Further intensive exploration should reveal many more, for beautiful raw material like chert of several shades, flint, fossil wood etc. is locally available in the out-crops of limestone at Dhaneri. In Eastern Rajputana microlithic sites occur near such outcrops, but unlike in the Western, only small nodules are available.

77. KHATRI, A. P., *Stone Age Cultures of Malwa*, (Ph.D. thesis), p. 182.
78. *I.A.R.*, 1956-57, pp. 8-11; 1957-58, p. 25; 58-59, pp. 26-8.
79. *Ibid.*, 1957-58, pp. 26-7.
80. HUNTER *in Nagpur University Journal*, Nos. 1-2, 1935-36, pp. 31 and 127, respectively.
81. GHOSH, A. in *I.H.Q.*, Vol. XXIV, 1948, p. 14. At Adamgarh, numerous microliths were found in black soil, *I.A.R.*, 1960-61, p. 18.
82. *Stone Age Cultures of Rajputana*, p. 207, ff.
83. *I.A.R.*, 1955-56, p. 61.
84. *Op. cip.* p. 207. At Adamgarh, numerous microliths were found in black soil, *I.A.R.*, 1960-61, p. 18.

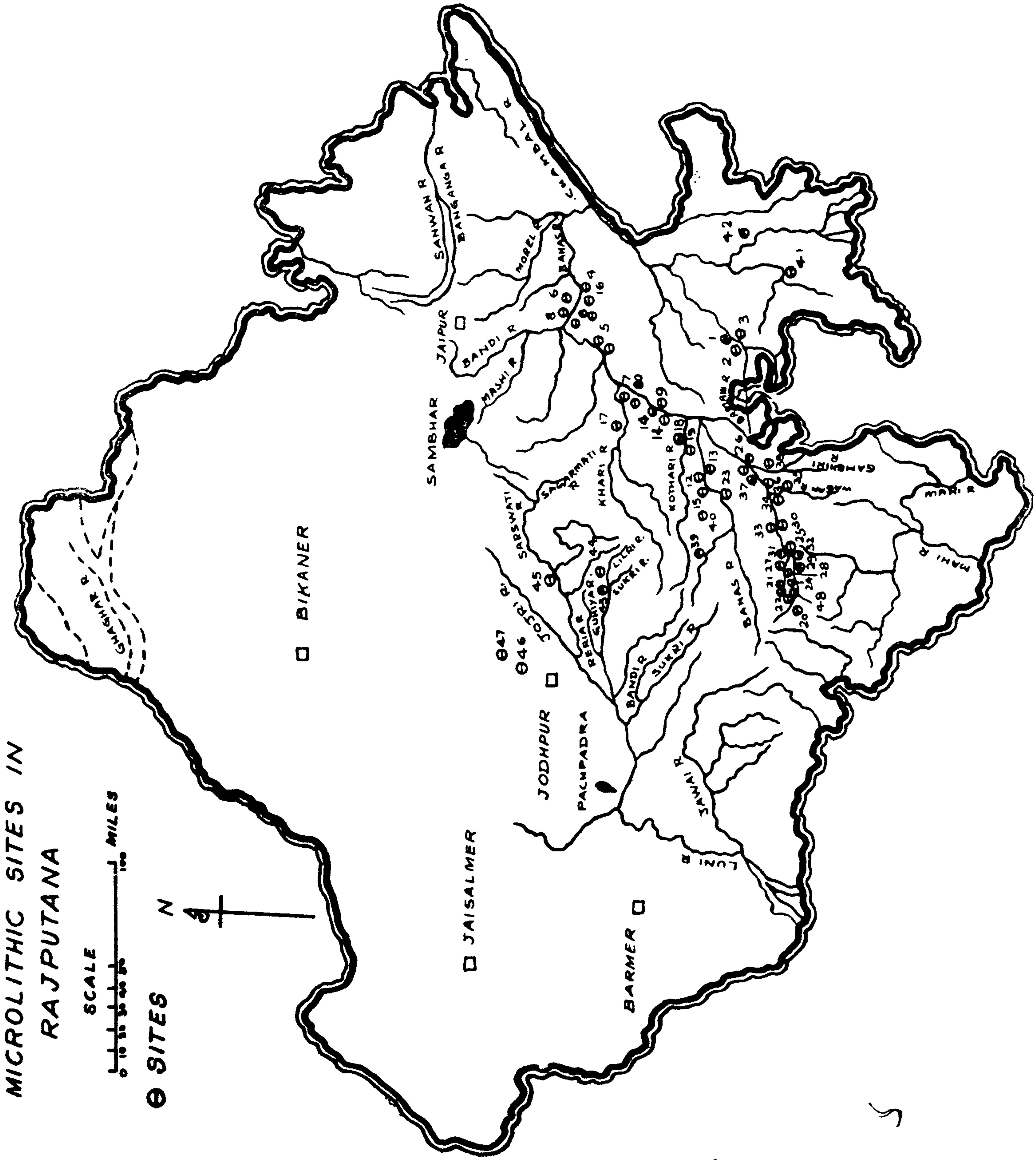

MICROLITHIC SITES IN RAJPUTANA
SCALE
MILES
SITES
N
BIKANER
JAISALMER
JODHPUR
BARMER
SAMBHAR
JAIPUR
PACHPADRA
SANWAN R
BANGANGA R
CHAMBAL R
MOREL R
BANAS R
BANDI R
MASHI R
SARSWATI R
SAGARMATI R
KHARI R
KOTHARI R
LILRI R.
SUKRI R.
GUHIYA R.
RERIA R
JOJRI R.
BANDI R
SUKRI R
JAWAI R
LUNI R
MAHI R
GAMBHIRI R
GHAGHAR R

Fig. 66.

However, no hint can be advanced as to the age of these Rajputana Microliths without excavations. The industry is primarily non-geometric. After this was written, the writer and his colleagues excavated at Ahar, Udaipur. A few microliths turned up in our excavations, as previously, and as at Gilund, but all these do not belong to the Copper or Chalcolithic deposits, but to an earlier phase of a hunting and forest culture. And thus we may say that in this region too the Microlithic Culture belongs to a period earlier than 2,000 B.C.

Antiquity

This review shows that in a few areas in India the microliths claim a fairly good (geological) antiquity. This in Tinnevelly or at Birbhanpur or even at Langhnaj and Adamgarh might mean the latest Pleistocene times or the beginning of Holocene. The exact age in years is difficult to guess, but may be placed between 10,000-4000 B.C.

Environmental change

In all the regions, an environmental change was definitely there, though differing in intensity and nature from region to region. But on the whole, a climate drier than in the preceding phase may be generally postulated. This had, as in many parts of the world, created sand-dunes. These as well as raised, dry, lightly forested regions were preferred as habitations by the microlithic people. Except in Northern and Central Gujarat no idea can be had of the contemporary fauna or flora (though even in Gujarat the evidence for the flora is almost nil). In Gujarat, the man was practically a hunter, and almost all the animals on whom he subsisted were wild (or of hunting type) except perhaps the dog. It is argued from the presence of small flat querns (found so far in numerous fragments which cannot be put together and hence no idea can be had of its size) that man probably pounded (wild) grains and might thus be placed in the higher rung of the ladder between a food-collecting and food-producing stage. This view does not seem to be justified. Firstly, the querns are indeed too small to pound anything on it. These are more like stones used today for preparing sandalwood and other pastes. Secondly, the writer, so far, has not come across a single grain in any one of the numerous excavations on the site or elsewhere in the region. The pottery evidence is also negligible. Not more than 10 to 20 sherds, not one indicating the probable shape of the vessel, have so far been recovered. Thus the Langhnaj Culture has got to be regarded as a Hunting and Food-Collecting one, whatever be its exact antiquity.

With regard to the microliths—whether they contain geometric element or not—they might have evolved from the earlier "blade and burin" industry or from Series II or Middle Palaeolithic tool complex. But nowhere such an evolution is available stratigraphically. The Kurnool evidence is not from one stratified site, but a typological grouping of the collection from a number of sites.

So we may end with the observation that the microlithic industries have a wide distribution, excluding Assam, the Panjab plains and Kerala and are associated with an environmental change; that they do indicate a change in the mode of life of man in India; but it is not exactly clear whether the microliths developed out of the earlier lithic industries or due to the influence of some external stimuli.

CHAPTER IV

NEOLITHIC AND CHALCOLITHIC CULTURES

WHILE announcing the general series of lectures, no specific mention was made of the Neolithic cultures. This was done advisedly. Even though the first neolith—a ground or polished stone implement—was found as far back as 1842[1] even after 100 years we really do not know much about the Neolithic Culture or Cultures in India. At best the various surface finds and some from the excavations can be plotted on a map and inferences may be drawn from the distribution pattern regarding the different types of tools and various cultural influences. This indeed is extremely inadequate and helps little in understanding the significance of a cultural stage which takes us to the very beginning of civilization.

Neolithic and Chalcolithic

Neolithic truly is a sub-division of the Stone Age and originally was conceived on a purely technological basis. It connoted that at this time the tools of man were of stone, but unlike those of his predecessors these stone tools were "ground" or "polished."[2] This simple definition of neolithic has long since been given up. It now means a cultural or economic stage when man had learnt not only to smooth his stone tools by different methods, but above all he had begun to produce his own food. Agriculture in however primitive a form was known. In addition man had begun to domesticate animals like the cow or ox, sheep or goat, pigs and dog. He also made pottery.[2a] All these singly or collectively imply that man lived at a fixed place. He was no longer a hunter, a hunter moving from place to place in small groups but had an organized community or social life. Thus he ceased to be a savage or barbarian. It goes without saying that in a true neolithic stage knowledge of metal —copper or iron—was not known. If we are to apply this definition to our knowledge of conditions in India, then we shall have to say that so far we know very little of a pure or full neolithic culture. Recently an attempt has been made by Shri V. D. KRISHNASWAMI[3] to give a picture of the neolithic pattern of India. While doing so he has divided the existing data into four neolithic provinces, (*a*), (*b*), (*c*) and (*d*). This attempt, no doubt, is admirable. But it does not make a sharp distinction between the Neolithic and the Chalcolithic cultural stages of man's development. It is no doubt true that these very often overlap and do overlap and therefore it is difficult to say when the Mesolithic as indicated by tiny stone implements develops into the Neolithic or where the Neolithic stops and the Chalcolithic begins. In spite of this it is possible to have a clear picture of the cultures which have been brought to light in the last 10 years in Central and Western India and to compare them with what we know of the surface distribution of ground stone tools from Southern and Eastern India. Before going into details, it should be pointed out that while the ground stone implement, irrespective of its exact type, is abundant in the East and South, in

1. According to Dr. F. R. ALLCHIN, "Piklihal Excavations", p. XI (For full reference see below).

2. Some writers distinguish between "grinding" and "polishing" but as has been pointed out elsewhere by the writer "polishing" is not a distinct technique, but the final stage in grinding.

2a. Even the knowledge of pottery is not now regarded as an essential prerequisite. For at Jarmo, Jericho and Hacilar in Iraq, Palestine and Turkey respectively pre-pottery (also called a-ceramic) Neolithic cultures have been unearthed.

3. KRISHNASWAMI, V. D., *Proceedings of the Forty-Sixth Indian Science Congress*, pp. 124-49.

Western India it has so far been found only in the Deccan and very casually in Central India and elsewhere in the North. In the South-east and in the East, it seems to form the basic industry. In addition, copper tools have not been associated with stone tools in the East and the South, except for solitary occurrences of a copper chisel and a copper and bronze rod at Brahmagiri, and also at Piklihal nearby, whereas in the West and Central India, it seems to occur more frequently. Likewise, short, parallel-sided blades do not occur invariably in the East. Again no cutting and heavy tools—whether of stone, copper, bronze—are reported from the Grey Ware levels in the Ganga-Yamuna Doab and South-east Rajputana.[3a] Thus the content of the various cultural complexes is indeed different and we should on the evidence say that the cultures of the East and the South formed the true Neolithic cultures. Those of Central India and the Deccan constitute the Chalcolithic cultures, whereas those of the Gangetic Valley fall into another group.

Taking these factors into consideration, it is here proposed to group the zones on certain technological grounds. It is not the occurrence of a few copper or bronze objects, the number of which has generally been very small, but the knowledge of smelting copper that is important. Thus the criterion of the difference between a Neolithic and Chalcolithic or Bronze Age culture is technological.

Admirable though this criterion is, it is rarely that sufficient evidence is available to decide from the discovery of a few copper objects in an excavation or a hoard, whether these are really imports from a genuine copper-smelting and forging area or the products of a local industry. Subsidiary criteria have therefore to be resorted to. Two of these have been here utilized.

Other Criteria

The first is pottery. As per present evidence, in Eastern India, in the absence of proper excavations,[4] no pottery is recorded. In the south-eastern, the pottery is basically hand-made and partly made on a turn-table ; whereas in the rest—Western and Central India—wheel-made pottery is the rule, the hand-made being an exception and confined to huge storage jars and the like.

The second criterion is the presence of the lithic blade and ground stone industries. From Eastern India, only the ground stone tools are known, the association of the blade industry with it not being yet established.[5] In the South-east, it appears, we have to make a sub-division : (*a*) Southern India having hand-made pottery and ground stone industry, but no (or very little of) stone blades, (*b*) South-eastern India, having a stone blade industry in addition to the above two. In Western India (Maharashtra) the stone blade industry plays a major role, the ground stone industry occupying a minor one.

3a. A large scale excavation at Ahar, Udaipur in 1961-62 seemed to show that the exploitation of copper was the main economic basis of the early settlers in the valley. See, SANKALIA, H. D., *I.L.N.*, September 1, 1962, p. 322.

4. See however below a small note based on a recent excavation at Baripada, Orissa.

5. However, as mentioned below, it appears that a true microlithic industry underlies the ground-stone industry.

In Central India, including Rajputana and Saurashtra, the ground stone industry is so far absent, whereas the blade industry is very prominent in Central India, but not so much in Rajputana and Saurashtra.

Thus with these three criteria (*i*) nature of pottery—hand-made or wheel-made ; (*ii*) the presence or absence of ground stone industry ; (*iii*) as well as the blade industry, we may *provisionally* distinguish between Neolithic and Chalcolithic cultures in Peninsular India as follows :

(*A*)	Pure Neolithic	comprising	(*i*) the whole of Eastern India, Eg. Assam, Bihar and Bengal	with	only ground tools.
			(*ii*) North-eastern India Eg. Kashmir,	with	(*a*) ground and bone tools (*b*) pottery (*c*) pit-houses
			(*iia*) Southern India. Eg. Lower Mysore	with	(*a*) ground tools (*b*) pottery (hand-made)
(*B*)	Neolithic-Chalcolithic	comprising	(*iii*) South-Eastern India. Eg. North Karnatak	with	(*a*) ground tools, (*b*) blade tools,
			(*iv*) North-West India. Eg. Early Baluchi Cultures.	with	(*c*) hand-made pottery
			(*v*) Northern Gujarat Eg. Langhnaj (no traces of houses)		(*d*) houses of wattle and daub.
(*C*)	Chalcolithic	comprising	(*v*) South-Eastern, Western and Central India. Eg. North Karnatak, Maharashtra, Malwa.	with	(*a*) blade tools (*b*) wheel-made pottery, mostly painted. (*c*) houses of wattle and daub.
(*D*)	Chalcolithic-Bronze Age	comprising	(*vi*) Northern and Western India Eg. Sind. Panjab, Saurahstra	with	(*a*) blade tools (*b*) wheel-made pottery (*c*) tools of copper and bronze (*d*) baked brick houses
(*E*)	Chalcolithic or Bronze Age	comprising	(*vi*) Northern India Eg. Ganga-Yamuna Doab and South-Eastern Rajasthan.	with	(*a*) wheel-made pottery (*b*) tools of copper and bronze (?) no stone tools. (*c*) houses of wattle and daub or mud walls with stone plinth.

It must be emphasized that no watertight compartments are envisaged. Discovery of earlier phases in the same zone, at the same site, or in its vicinity or co-existence of two cultures at slightly different levels is not ruled out. Much depends upon the chance of excavation, and the extent of the area excavated. Nothing illustrates this better than Maski and Piklihal, both in the Raichur District. At the former site, numerous stone axes were found earlier, but not one in a later, well-conducted excavation. At the latter small blades and cores were found along with the ground stone axes, and hand-made pottery.

Thus the scheme here set forth is *strictly provisional,* applicable to our little knowledge available today.

Dating

A word regarding the dating and the discussion of various groups in this book. The Indus Valley Civilization, its maturer phase at least, is dated by C-14

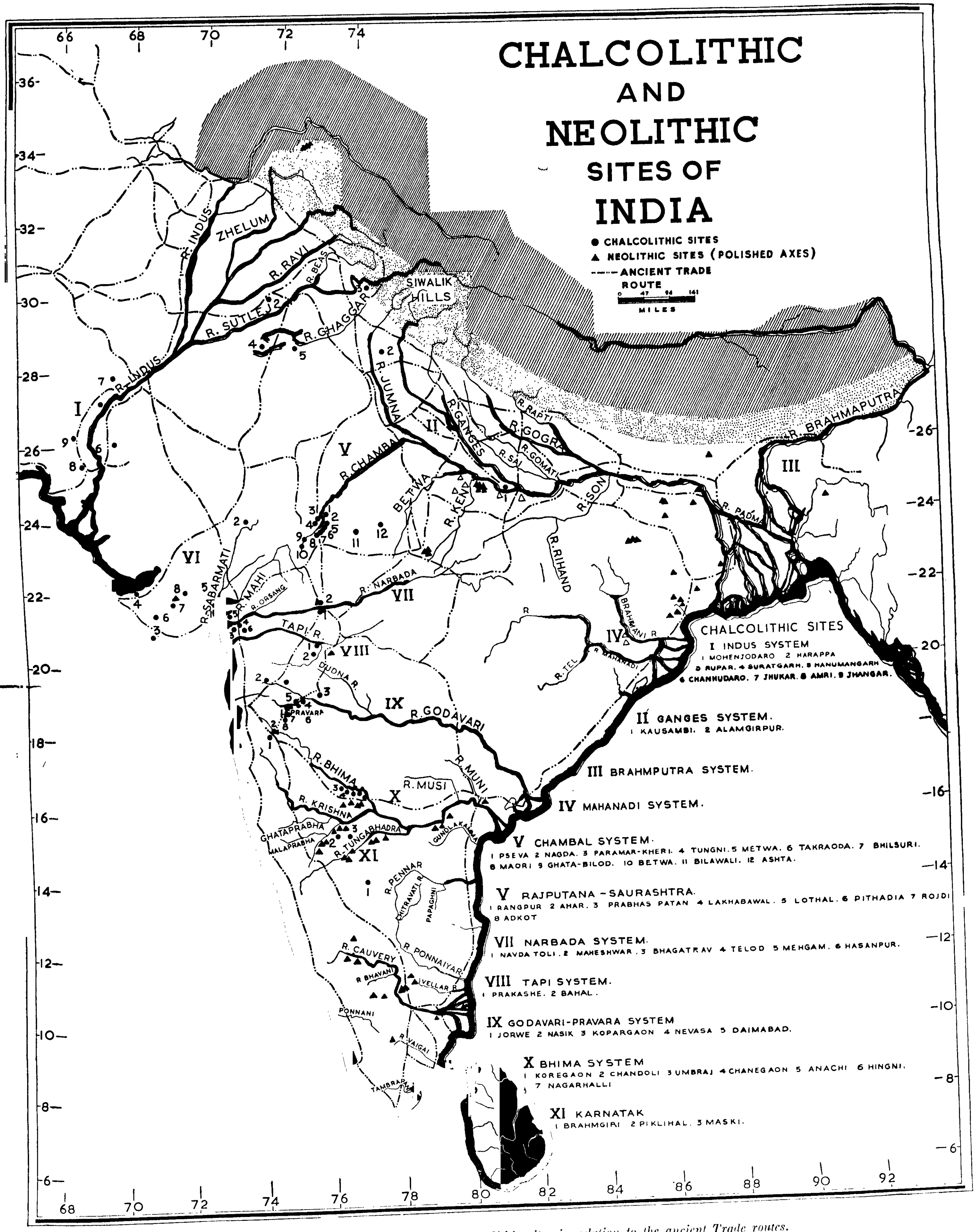


Fig. 70 Map showing the Chalcolithic and Neolithic sites in relation to the ancient Trade routes.

method to c. 2500 B.C., thus confirming its hypothetical dating based on stylistic and other evidence. The various Chalcolithic cultures, particularly the Navdatolian of Central India, and that of the Banas Valley are again c. 1800 B.C. and thus seem to be contemporary with or follow closely the decline of the Indus Valley Civilization. These in their turn are followed by the Painted Grey Ware Culture in the Gangetic Valley, and with a break (or without break) by the historic cultures in Peninsular India.

No exact date is yet available for the Eastern Neolithic. But it is believed to be later ; but how much late, cannot be said at the moment. But the South-eastern Neolithic or "Neolithic-Chalcolithic" in our terminology has been dated by C-14 to c. 2000 B.C. and is thus partly contemporary with the decline of the Indus Valley Civilization.

Chronologically thus the development of various regions is very uneven and cannot be treated in a very logical way, beginning with the Neolithic and passing through the Chalcolithic and Bronze Age into the Iron Age or the Early Historic.

The expansion of the Indus or Harappa Civilization is treated first, then the Painted Grey Ware Culture of the Gangetic Valley and the Chalcolithic Cultures of Central India and the Deccan. Description of the Neolithic Cultures of Eastern and South-eastern India is take up last, to be followed by the discussion of significance of these new discoveries.

A

The Bronze Age and Chalcolithic Cultures of Northern, Central and Western India

The Indus or Harappa Civilization

During the last ten years extensions of the Harappa or Indus Valley Civilization have been located in East Panjab and Uttar Pradesh, almost near Delhi ; in North Rajputana in the former State of Bikaner, in Kutch and almost all over Saurashtra, and Central and Southern Gujarat as far as Surat, and in the west not only at a number of places in Baluchistan but right on its sea coast. Equally significant are some of the new features.

The frontiers of this civilization which were already very extensive,[6] some 1,000 miles by 5,00 miles have been further extended by some hundred miles both in the east and the south (*Fig. 67*). Thus *roughly* the civilization covers an area of 12,00 × 700 miles = 84,00,00 square miles, in area. Not only is its vast expanse remarkable and unique for a prehistoric (really protohistoric) culture, among the then contemporary or immediately earlier or later cultures, but it is also noteworthy for the almost unfailing uniformity of the various aspects of the civilization such as town planning (including mud-brick ramparts), well-aligned brick houses, sanitation, pottery, seals, ornaments, weights and measures, and methods of disposal of the dead.[6a] No doubt a few variations have been observed in pottery

6. WHEELER, R. E. M., *The Indus Civilization*, p. 2.

6a. Curiously the so-called "mother-goddess" figurines of baked clay have not yet been found outside Sind and Baluchistan, and even here it is at Mohenjodaro and Harappa that these are found in large numbers. May be this fact is significant and suggests that these were the real religious centres.

fabrics, forms and designs, but these cannot be discussed here in detail unless and until full reports of three or four important excavations are published. Nevertheless, some great unifying factors seem to be actively working behind this feature. What it is, we do not exactly know—a great governmental organization, or the innate sense of its citizens trying intentionally or unintentionally to repeat the same features of their city life wherever they went or their basic needs for such means. Whatever be the facts, with these also went the various technological skills of the city-planner, architects, engineer, mason, brick-maker, potter, seal-engraver and metallurgist. But the questions still remain how and why did the Harappan culture spread eastwards and southwards (and westwards)? Was it a peaceful advance, in the natural course of events, towards the fertile plains of the Ganges? Or did they flee as refugees before some invader? None of these questions can be answered satisfactorily for want of adequate evidence.

East Panjab and Gangetic Valley

Excavations at Rupar and Bara in East Panjab, Alamgirpur near Meerut, and several sites in Bikaner suggest that these sites were occupied after some lapse of time by the Painted Grey Ware people after they were abandoned by the Harappans. In Saurashtra the story seems to be different. At Lothal the main Harappan Civilization shows a maturity and degeneration, but no replacement by another culture. At Somnath (Prabhas) a few Harappan features have been noticed in the pottery forms in the lowest deposits, which indicates that the habitation began with a Harappan bias, but this was soon lost when other influence became dominant. This was not the case at Rangpur, where a kind of evolution is witnessed after Period II, suggesting that the Harappan culture was not forcibly replaced or abandoned, but changed imperceptibly into a new one owing, of course, to contact with newer elements. Thus the story of the Harappan Civilization is different in the Panjab and Saurashtra, two of the most outlying provinces of its culture-spread.

With this introduction, we shall see in some detail these regional manifestations, though the account cannot be in any sense final, unless definitive reports are published.

Sites in East Panjab

The Harappan settlements in East Panjab are found, to date, on the Sirsa and other smaller tributaries of the Upper Sutlej, now comprised within the districts of Ambala, Jullandar and Bhatinda. Thus besides Rupar, which is the principal site, we have Bikkum[7] or Dher Majra, Bara, Kotli, Talapura, Chamkaur, Howra (having an extensive mound), Dhang, Merhanwala, Dhogri, Madhopur,[8] near Jullandar and Raja Sikak,[9] 2 miles to the south of Faridkot. The sites at Dhang and Merhanwala are situated on the river terraces and flat surfaces on the hills. It is therefore felt that the Harappans proceeded into the hilly terrain along the valleys of smaller rivers. If this can be proved by further work, it may mean a regular colonization. Similar phenomenon is witnessed in the Deccan, where sites of the Chalcolithic period of Jorwe-Nevasa type are found in very hilly terrains, which even now are desolate.

7. *I.A.R.*, 1953-54, p. 38.
8. *Ibid.*, 1956-57, p. 79.
9. *Ibid.*, 1958-59, p. 73.

Rupar

So far only Rupar[10] and two sites nearby called Bara and Salaura have been partially excavated. These have yielded very significant evidence regarding the relationship between the Harappan and the later Painted Grey Ware Culture. The Harappan occupation at Rupar took place on the fluviatile sandy deposits; Bara was built with the debris of late Harappan material; Salaura, only 300 yards to the east of Bara began with the Painted Grey Ware. In addition, at Rupar itself the latter ware was found over the two phases of the Harappan culture. This juxtaposition proves that the Harappan is the earliest culture in the region, and the Painted Grey Ware came much later. The pottery forms at Bara show new forms, not known in the true Harappan, but found in Bikaner. This further seems to suggest that Bara continued to be occupied when Rupar was abandoned by the Harappans. Thus in East Panjab it will be possible to build up a regular sequence of cultures within the Chalcolithic beginning with the Harappan, late Harappan, degenerate Harappan, gap, Painted Grey Ware, and the N. B. P.

The mound at Rupar is nearly 50 ft. high, and occupies a strategic position, viz. at the junction of the plains and the Himalayan foothills. Here the Sutlej enters into the fertile plains of the Panjab. Owing to this fact, it was repeatedly inhabited and also destroyed, as it lay on the path of the invaders.[11] The several strata show six cultural periods, of which the first two fall within the proto-historic period. Period I constitutes the Harappan and its derivatives, and therefore it is sub-divided into two phases. Its lower deposits exhibit a late phase of the mature Harappan, while the upper deposits introduce new ceramic traditions.

Not much is known about the houses, though four phases of the Harappan buildings were encountered, because the excavations were limited in extent. However, one can definitely say that from the very beginning the first settlers used the local material in the shape of river pebbles, roughly hewn *kankar* stones, besides the traditional material viz. mud-bricks and baked bricks[12] with which they were familiar. Mud was also used as mortar.

While the ornaments of faience, and various other beads, the steatite seal, terracotta cake, chert blades and bronze celts are but replicas of the now well known sites of Mohenjodaro and Harappa, and need no comment, the pottery assemblage[13] shows a few variations, which might be explained as a regional phenomenon, or as the excavator thinks, a degeneration or a new feature. The typical Harappan forms include the dish-on-stand, cylindrical beaker, flat platter, shallow basin and perforated brazier. The goblet with pointed bottom is rare, and absent in the upper levels of the Harappan phase. On the contrary, characteristic incised designs on pottery make their appearance now.

Interesting, however, are the burial practices. These confirm once again that among the Harappans, the cemetery was always at a little distance away

10. Rupar is about 25 miles from Chandigarh.

11. *I.A.R.*, 1953-54, p. 7 and SHARMA, Y. D. "Excavations at Rupar", *Lalit Kala*, Nos. 1-2. (1955-56), pp. 121-29.

12. *Ibid.*, 1953-54, p. 7.

13. *Ibid.*, pls. IIIA, IVA.

from the main habitation area. It is now a low mound, about 160 ft. to the west of the inhabited area. This was disturbed by the Painted Grey Ware people. However, some skeletons have remained intact. The grave pits, 8 ft. × 3 ft. × 2 ft., were dug into the natural soil. Within the pit, the body was placed in an extended position, with the head usually towards the north-west. In one case, the body lay north-south. Most burials had a group of pots at the head, feet and on the sides of the body. But in one burial, the pots seemed to have been arranged first and then covered with earth. The body was placed last (where?) and the pit was finally sealed.[14] The number of pots was not uniform, but varied from 2 to 26. This might be according to the status in life of the individual buried, and so give some idea of the needs, while alive and dead.[15]

Bara

The work at the nearby mound of Bara is very briefly noticed. As mentioned earlier it consists principally of the very late Harappan phase. Some pottery forms are new, whereas there is diversity in slips and paintings,[16] which is not found in the lower levels at Rupar: large water-jars and cooking vessels, and bare horizontal or wavy incised lines,[17] a feature which is supposed to be present in the Harappan sites in Bikaner, but unknown at Harappa and Mohenjodaro.

Alamgirpur

Alamgirpur[18] in Uttar Pradesh continues the story of the Harappan expansion in the Ganga-Yamuna Doab. The site is situated about 2 miles off the left bank of the Hindon, a tributary of the Yamuna, It is 17 miles west of Meerut and 28 miles north-east of Delhi. It is worth watching whether this Indian city also becomes one of the Harappan outposts, and thus the oldest continuously inhabited capital in India. Excavations here revealed four periods of occupation. Periods I and II respectively belong to the Harappan and Painted Grey Ware cultures. Both, however, are separated stratigraphically and culturally. The top surface of Period I was hard and whitish suggesting a long exposure. It was further found covered with weather-worn potsherds.

No building phases were brought to light in the excavations proper, but kiln-burnt houses have been evidenced by the occurrence of two sizes of bricks : the smaller $11\frac{1}{4}$ to $11\frac{3}{4}$ in. × $5\frac{1}{4}$ to $6\frac{1}{4}$ in. and $2\frac{1}{2}$ in. to $2\frac{3}{4}$ in. in thickness and the larger averaging 14 in. × 8 in. × 4 in. Some of the bricks bore three figure marks.

There is nothing to note about pottery, ornaments, etc. which are identical in type with those of the true Harappan. Interesting are the platters with a ring-base or three low legs and troughs bearing incised Harappan symbols. If the low-legged plates were used for making bread, as it is suggested by Dr. SHARMA, then the antiquity of the present contrivance is very great. The existence of woven cloth was provided by impressions on a trough. The yarn seems to be

14. *I.A.R.*, 1954-55, p. 9.

15. A personal visit to Rupar after these lectures were delivered makes me feel that the site deserves a "total" or horizontal excavation to enable us to know the life of the people in East Punjab at various periods of its history.

16. *I.A.R.*, 1954-55, pls. X, XIA.

17. *Ibid.*, pl. XIB. Simple horizontal black bands have now been proved to be a feature of the Early Harappan at Kot Diji and Kalibangan.

18. *I.A.R.*, 1958-59, p. 50-52, Pl. LXII-LXV.

fine, though not of uniform thickness. Among the animal figurines, those of a bear (?) and a snake deserve notice. (Cf. Snake motif on Lothal II pottery p.166).

Saurashtra

As far back as 1934-36, Saurashtra had yielded evidence of Harappan penetration. Pandit VATS[19] and Prof. GHURYE[20] discovered Rangpur and carried out preliminary digging there. Later it was further excavated on a very small scale by the writer and Dr. DIKSHIT. The latter scholar[21] thought from his study of pottery that Rangpur had little of Harappan traits. Since then the site has been more fully explored by Shri S. R. RAO[22], who has undoubted evidence of Harappan occupation there[23]. Soon after Lothal was discovered by the last mentioned scholar[24]. Now every year explorations bring to light more and more sites of this culture almost all over Saurashtra—eastern, western, northern, southern and even central (which was supposed to be immune from this enveloping movement) so that the whole of the peninsula seems to have been colonized by the Harappans. If they came from Sind, as it seems most probable, then the coastal route[25] seems to have been preferred, small groups arriving by boats which would keep as near the coast as possible. Whether Kutch was first colonized and Saurashtra later, or the former was treated as a half-way house (the destination being Saurashtra) cannot be definitely known,[26] unless Kutch is fully explored and one or two sites excavated which would prove the priority of the Kutch Harappan over that of Saurashtra. To date, typically Harappan pottery—perforated jar, handled bowl, dish-on-stand besides steatite beads, microliths and copper objects—have been reported from the surface at Desalpur,[27] on the left bank of the Morai river, Nakhtrana taluka, and Todia Timbo[28] in Lakhpat taluka.

Northern Rajasthan

In Northern Rajasthan through which flow the Vedic Sarasvati and the Drishadvati rivers, a number of Harappan sites have been discovered. Sir Aurel Stein noticed a few in the extreme western border in the former Bahawalpur State (now in Pakistan). Many more were noted by Shri A. Ghosh. Of these, a site called Kalibangan on the southern bank of the Ghaggar (ancient Sarasvati) in Ganganagar District has been systematically dug since 1961. The ancient habitation was spread over an area of about a quarter of a square kilometre and from the beginning consisted of two closely knit but distinct mounds. The one on the east is larger and higher (11 metres or 36 ft.), the second being 8 metres or 26 ft. But their size is not the only distinguishing feature. While both the mounds show the chracteristic Harappan well-oriented roads and houses and drains alongside, a sure sign of town planning, the western mound was thought to reveal a massive mud-brick platform over which stood houses or remains of a

19. *A.S.I.A.R.*, 1934-35, pp. 35-8.
20. GHURYE in *J.U.B.*, vol. III (N.S.), 1939, pp. 3-11.
21. DIKSHIT, M. G., *B.D.C.R.I*, Vol. XI, 1950, pp. 1-55.
22. *I.A.R.*, 1953-54, p. 7 ; 1954-55, p. 59; 1956-57, p. 80.
23. The full report is in press, and is expected to be published in 1962.
24. *I.A.R.*, 1955-56 and later.
25. See, however, below writer's comment, p. 164.
26. RAO, S. R. " Excavations at Lothal " in *Lalit Kala*, Nos. 3-4 (1956-57), p. 82, seems to think that Desalpur in Kutch and Lothal are the earliest Harappan sites in Kutch and Saurashtra respectively.
27. *I.A.R.*, 1955-56, p. 70. It is regarded as a very promising site.
28. *Ibid.*

citadel as at Harappa and Mohenjodaro. Hence Shri Lal conjectured that Kalibangan could be a third provincial capital, guarding the Sarasvati Valley.[28a] However, further work this season (1962) has not confirmed Lal's surmise.

But another explanation is possible for the supposed mud-brick rampart and the only extensive remains of the burnt-brick drains found so far[28b] either in this trench or elsewhere on this mound. This mound overlooks the Ghaggar river and is also smaller and so is likely to be more easily flooded than the eastern. Hence the need of a rampart and baked bricks. However, this point should be settled by the actual " contents " of the houses in the western mound. Whatever it be, the construction of houses shows features peculiar to this site or the valley. First, unlike elsewhere, the houses by and large have been built with mud-bricks, the latter often plastered with a coating of mud. (*Pl. XI, Fig. 70A*) The floors made of rammed clay were paved with terracotta nodules, interspersed with fairly large bits of charcoal. Not only this method of flooring survives in the neighbourhood today as noted by Lal, but these nodules, on the erosion of the mound, litter the surface, making it a prominent feature not noticed either in the Indus Valley or other protohistoric and historic sites in India. The famous terracotta " cakes " were also utilized for paving floors, though it is difficult to say whether this was their primary or secondary use.

How the houses were roofed at Mohenjodaro, Harappa and Lothal is not known. But at Kalibangan were found wooden rafters embedded in mud and Shri Lal thinks " that these might have supported, with a cushioning of reeds, a flat mud roof such as is in vogue in the region today."[28c] Another intriguing feature of these houses is the presence of " small oblong enclosures of mud-bricks often containing broken bits of jars and clay-lined oval pits full of charcoal and occasionally having one or more bricks in the middle." Small mud-lined oval formations round a shallow pit, having a stone within were also noticed by us in the Chalcolithic deposits at Nevasa. But there too the exact purpose could not be determined.

Among the smaller, portable objects while the large majority were after the typical Indus type, two objects deserve attention. One is a small terracotta, human head with a receding forehead, long, ovalish eyes, straight, pointed nose, rather thick lower lips, and firm chin. It certainly recalls a similar head from Mohenjodaro, although other features are missing. Equally notable and charming is the terracotta figure of a charging bull or goat (*Pl. XII, Fig. 70C*).

The second is the occurrence of inscribed letters on potsherds which by their superposition show, as Lal has so intelligently pointed out, that the Indus script was written from right to left. But then it has to be remembered, as Sir Mortimer Wheeler remarked on Lal's lecture, that the Indus script was also boustrophedon (that is written from left to right as well). Thus these potsherds from Kalibangan do not provide exclusive evidence as to the method of writing the Indus script.

28a. *I.L.N.*, March 24, 1962, p. 454, and *I.A.R.*, 1960-61, p. 31.

28b. Based on the personal inspection of the site in 1961 and 1962, facilitated by the kindness of Shri B. B. Lal and Shri B. K. Thapar.

28c. LAL, *I.L.N.*, March 1962, p. 454.

However, the most important data which Kalibangan provides is the insight into the origin or, better, earlier phases of the Indus civilization. Last season (1961), the lower levels had yielded thin, unslipped, dull red ware. The shapes seem to comprise small and medium-sized globular pots with a small out-turned rim. Usually there is a broad black band round the neck, followed by other bands and patterns.

Pottery believed to be similar was previously noticed by Wheeler in the pre-defence deposits at Harappa in 1946 and recently has also turned up at Kot Diji in Sind. (*See Fig. 71*) However, some scholars who have handled the pottery from these sites feel that the correspondence is not very close. This season (1962) Shri Thapar has succeeded in isolating it at Kalibangan in the earliest layers. Thus there is no doubt that such a pottery was not the regular feature of the Harappan culture. Now the question is, is it pre-Harappan or proto-Harappan, that is, does it belong to a people who were quite different from the Harappan folk, or does it belong to the Harappans themselves, but in their initial, formative stage when they did not cover their pottery with fine red slip, nor make it very sturdy, and further decorate it with characteristic Indus designs? In understanding this problem, pottery should not be the only diagnostic feature. A site like Kalibangan if more fully dug (as it seems it will be) should also inform us about the details of life—method of house construction, house-hold objects, tools and weapons—of the two or three main phases at the site. All these would help in ascertaining whether these phases are but the reflections of an evolving way of life or of different people with different ways of life.

Added significance is lent to this problem because we have almost identical Carbon-14 dates for the top phases of Kalibangan and Lothal, viz. 4070 ± 115B.P. and 3980 ± 115B.P. And if these phases have also yielded identical or similar pottery and other objects, then it would mean that the same forces were at work in both these regions, lower Saraswati valley and northern Saurashtra.

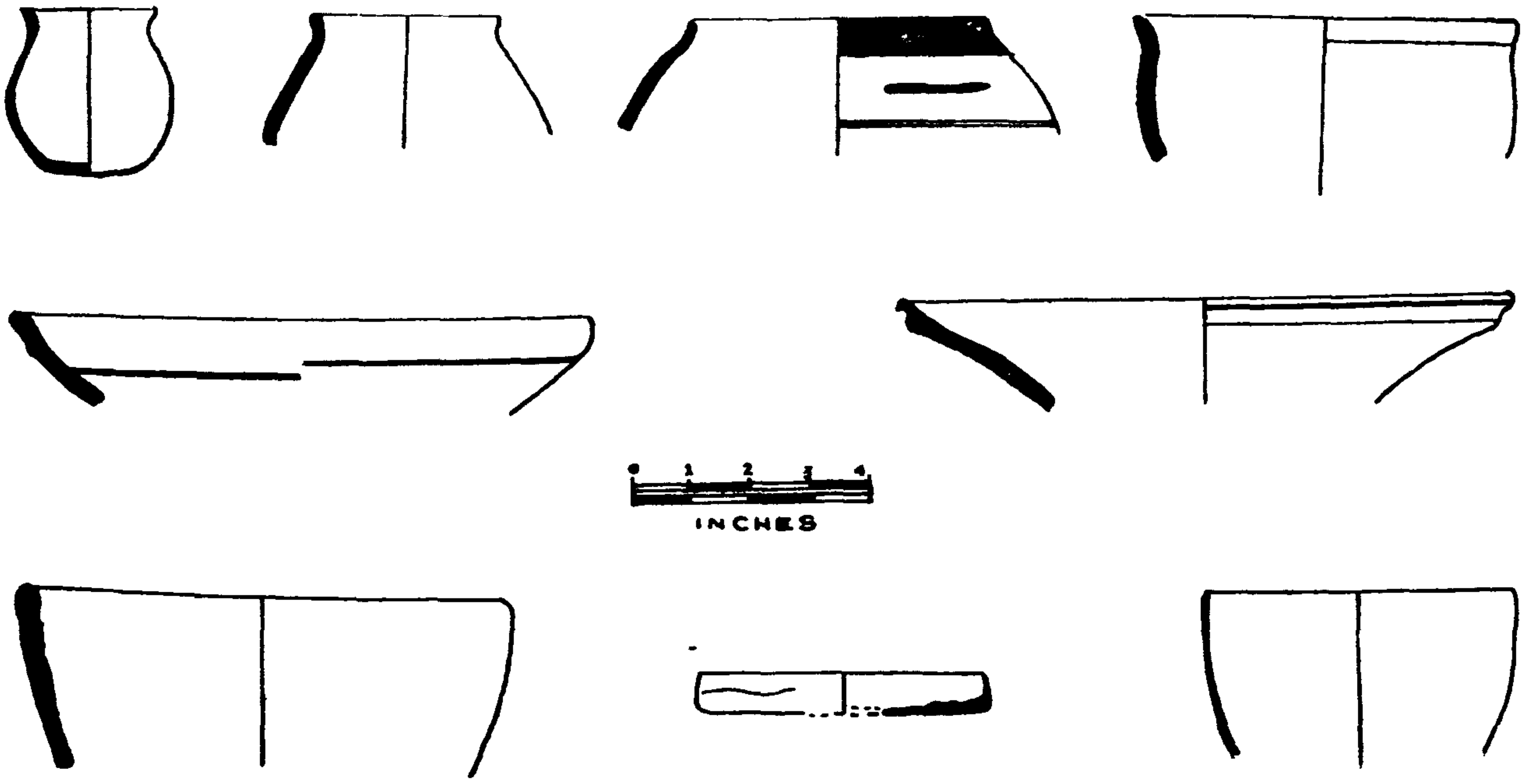


Fig. 71. Pre-defence pottery from Harappa.

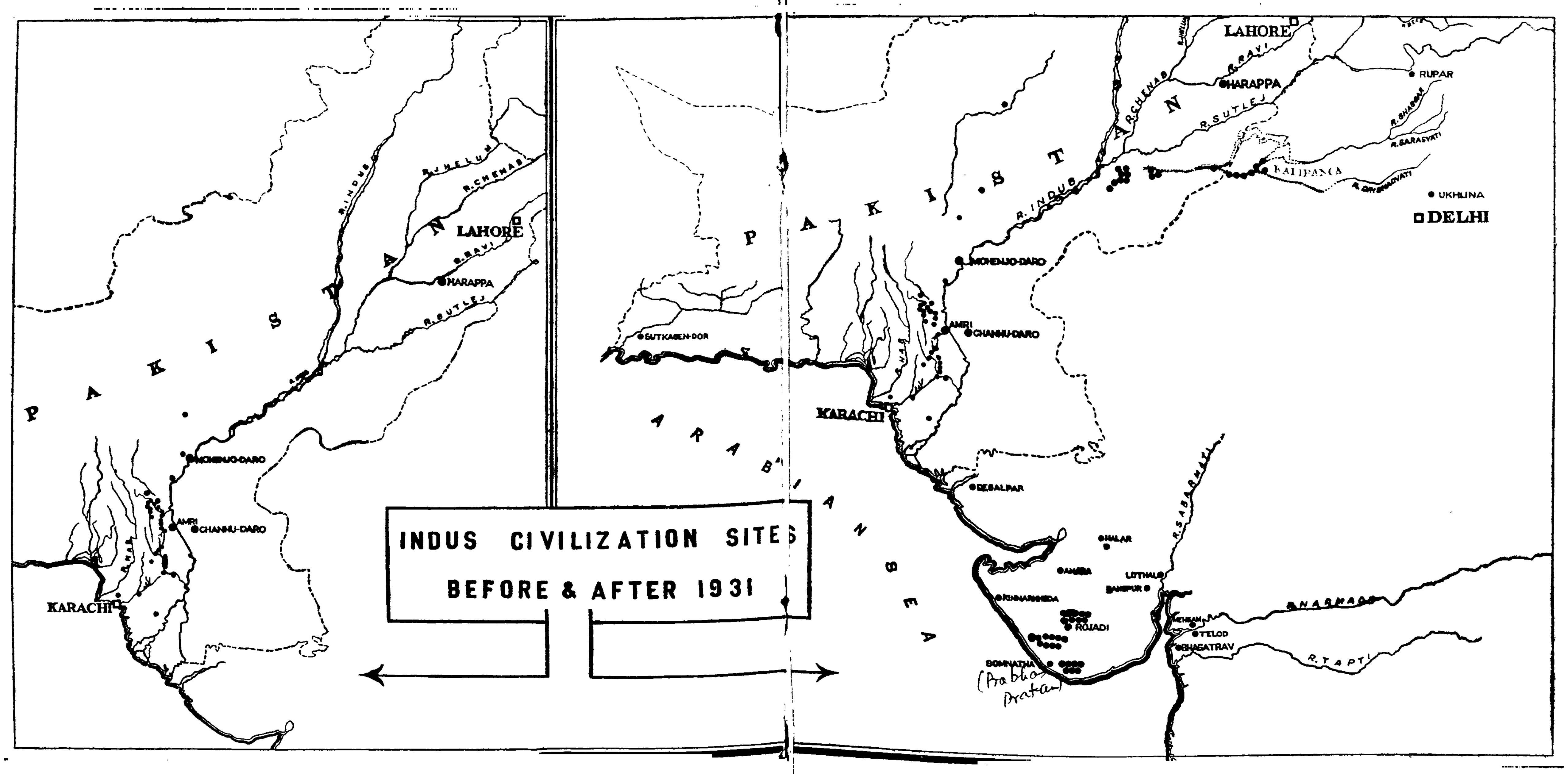


Fig. 71. Add site of Sotka-Koh on the Makran Coast.

So far as it is known, the top phases at Lothal distinctly reveal a new pottery. Such is not the case at Kalibangan.

Why did the Harappans go to Saurashtra? Was it a migration or colonization or an outward march from Sind for "capturing markets"? Unless the causes of the destruction of the Harappan civilization in Sind and Harappa are well known, the question of this migration or coming as refugees may be ruled out. The last alternative can be considered only if we know of the existence of some earlier inhabitants in Saurashtra who were sufficiently advanced culturally so that trade relations with them would be profitable. Of course, while finally discussing this point, the oft-repeated expressions that the Harappans were traders and chose site near some river and sea ports have to be taken into account. A suitable port is necessary, if there is a continous water traffic by sea or river. No conclusive answer can be had at this stage; nevertheless, the question may be discussed a little more fully after we know of the Harappans in Saurashtra in some detail.

First Rangpur, then Lothal, were the only partially excavated sites. However, since 1958 Rojadi near Rajkot seems to be another important Harappan settlement, and there might be a few more, if not many. Lothal, nevertheless, remains the only extensively excavated Harappan habitation in Saurashtra.

Lothal

Set in a dead flat alluvial marshy low-land called "*Bhāl*" in Gujarati, almost at the junction of north-eastern end of Saurashtra Peninsula and mainland Gujarat, it may be claimed by both. Today Saragwala, the village which shelters Lothal (mound of the dead)[29] is included in Ahmadabad District, being nearly 60 miles due south of that city. Anciently, the site might have been on the confluence of the rivers Bhogava and the Sabarmati which is now removed to a distance of nearly two miles to the south-west of Lothal. While this may have been the initial factor in the selection of the site by the first settlers, this very proximity to the rivers nearing the estuary brought repeated and final destruction of the habitation.

In fact, a careful topographical study of the region would show that Lothal once was on or very near the sea. For, now the region of the Nal lake marshes which joins Saurashtra Peninsula with mainland Gujarat was, as was well inferred by the writer in the *Bombay Gazetteer*,[30] some 2,000 years ago, or in the time of the Indus Civilization, under sea which connected itself with the Gulf of Cambay on the south-east and that of Kutch on the north-west. Saurashtra thus must have been an island. Later silting in the above mentioned gulf and the probable decrease in sea-level formed a low, marshy land, which even now gets easily flooded during the monsoon and becomes an inland lake, locally known as '*Nal.*' Its southern part is called *Bhāl*. Here is situated the mound of Lothal.

The area is so flat that no one can imagine that there is a mound which harbours the debris up to a depth of 22 ft. Superficially it looks like a small mole on a large body. Within this debris are enshrined the remains of a town which, according to the latest interpretation of the building levels, showing signs of

29. Rao, S. R., in *Illustrated London News*, Feburary, 25, 1961, p. 302.
30. *Bombay Gazetteer*, Vol. VIII, Kathiawar (1884), p. 559.

destruction by flood and other material data, had witnessed two main periods. Period I, having four sub-phases and dated between 2500 B.C.-1500 B.C. is regarded as the manifestation of mature Harappan Civilization, while decadence characterizes Period II (1500-1000 B.C.)[31]. As the mound and the surroundings imperceptibly merge, the exact extent of the town is difficult to calculate, but it is suggested[32] that " the town must have been twice as large as that indicated by the present mound."

Town

Though small, some 2 miles in circumference, it was a well-laid out town, a " miniature Mohenjodaro "[33] with a rampart encircling main habitation, a cemetery without at a distance of one furlong in the north-west corner, and a unique, large brick-built enclosure, which might well be a dockyard, the first of its kind to be unearthed in India or anywhere else. Lothal thus exhibits the characteristic features of the " twin metropolis " and something new in addition.

" The town," it is said,[34] was divided into six blocks, each built on an extensive mud-brick platform of a varying height. So far four streets, two from north to south and two from east to west, with two side lanes have emerged from the excavations. On one side of a street lies a row of 12 houses. Smaller houses on either side of another street are believed to be shops, each with two or three rooms, with different dimensions, 12 ft. × 9 ft. to 8 ft. × 6 ft. A few larger houses measured 72 ft. × 42 ft. Some had verandahs in front, while others had a central courtyard with rooms around. The houses of artisans like coppersmiths and bead-makers were small and made of mud-bricks.

The town had, as usual, a fine system of sanitation which included a public drain, internal drainage which was joined with the main road, bitumen paved bath-rooms and lavatories with a soak-pit behind. A very elaborate drainage in a large house in the south block built over a terraced platform coupled with a separate well might have belonged to an important person, or might be a public house, since it overlooks a large dockyard.

Dockyard (Pl. VIII, Fig. 68)

This huge brick-lined enclosure is situated on the east of the town, by the side of a mud-brick and mud-built rampart and assigned to Phase II, Period I, Roughly trapezoidal in plan, from north to south it measures nearly 710 ft. and 120 ft. from east to west. Built with baked bricks its extant height is 14 ft. but it might have been originally much higher. There is a large opening, about 23 ft. wide, in the wall on the eastern side. This is believed to be the " inlet " channel, whereas on the south, there is a smaller opening called, "spill channel " which might have been for regulating the outflow of the water by the insertion of a wooden door in the grooves provided at the mouth. The Sabarmati now flows at a distance of about two miles from the eastern wall of the enclosure. It is possible that formerly, some 4,000 years ago, it flowed much nearer and

31. RAO, *I.L.N.* p. 302, C-14 dates are 2018 B.C.-1913 B.C. and 1818 B.C. respectively.

32. *I.A.R.*, 1958-59, p. 13.

33. This seems to be more appropriate than " miniature Harappa ", as suggested by Rao in *Lalit Kala*, *op.cit*, p. 84, Shri RAO in his latest " version " of Lothal uses the terms " acropolis " and " lower town " *I.L.N.*, p. 302.

34. *I.A.R.*, 1959-60, p. 17.

at high tide, the water could be carried inwards through a specially built canal—which this year's excavation shows was cut into the bedrock and provided with brick walls—to facilitate the navigation of small ships. This would become still more easy, if the Bhal area which forms a part of the former Nal Lake (now marshy) was originally a sea.[35]

Whether this enclosure is a dock-yard or something else can indeed be proved by (1) stratigraphically connecting the dock-yard with the present or extinct Sabarmati river, exposing the ancient channel—its sandy banks etc. (2) by consulting the traditional navigators (*kharvas*) who still ply small as well as large boats in the numerous ports in Saurashtra ; (3) by searching for parallels in Egypt and Crete and Mesopotamia. Unless at least one of these investigations is made, the matter will have to be left in an undecided state, with a statement that there is undoubtedly some evidence to regard the enclosure as a dock-yard.[36]

In other ways too Lothal is an exact replica of a true Harappan town. The town folk enjoyed the same prosperity as witnessed at Mohenjodaro, for instance. Fine, well-made, sturdy pottery recalling in shape, designs, fabric, and even in the levigation of clay the now famous Indus pottery (*Pl. X, b*). But in addition to the beakers, goblets, troughs, dishes-on-stand, knobbed vessels with-flaring sides, perforated jars and lamps in thick red or buff ware, there is a black-and-red or cream ware which is throughout contemporary with the usual ware. While this ware is different in the technique of manufacture, it shows no new forms. Some of the Harappan forms are copied in it.

However, a few new ceramic forms are visible in Period II. (*Pl. X, d*). These are supposed to be evolved from the earlier ones and virtually ousted the latter. These new forms include (a) bowl with blunt carinated shoulder, and a simple dish without carination on a squattish stand. Goblets, beakers and perforated jars are absent. While some old designs like hatched and filled triangles and oblong and alternately hatched squares are common with Period I, some designs[37] such as snakes, very realistically drawn stags and ducks are new. If these and others also occur in Period I, then Lothal should be regarded as not mature or true Harappan but as Wheeler calls it a " sub-Indus " variety.

The regularity in town planning is said to be a feature of Period I. Later degeneration is evident : the houses are out of alignment and drains haphazardly laid.

However till the very last, efforts were made to protect the town from recurring floods by mud platforms, a feature witnessed at Mohenjodaro, Harappa and Rangpur. Right from the beginning houses were built on such solid mud-brick platforms, and every time floods caused destruction, the platforms were raised. In addition the main habitation was protected by a mud-brick rampart.

35. As pointed out above.

36. After these words were spoken, Shri Rao has stratigraphically connected the enclosure with the old river-bed and also consulted the traditional and modern naval engineers. And it is felt that this could be a " dock-yard " and described as such in his article in *I.L.N.* That the Harappans had regular " ports " now seems to be an established fact by the discovery of ports on the Makran coast. For details see below.

37. *I.A.R.*, 1957-58, p. 13, pls. XVA B, XVII A and XVI B.

Ornaments

Ornaments of various materials—like shell, ivory, steatite, faience, terracotta, semi-precious stones (agate and carnelian), copper and gold—beautifully polished weights, gamesmen, figurines in terracotta and copper once again testify to the artistic skill of the Indus Saurashtra craftsmen. There is, for instance, a small copper dog, which even though now encrusted, has a beautiful expression.[37a] And the gold necklace in five lakh (500,000) tiny gold beads with spacers. (For typical beads *see Fig. 101A*).

Toys

While these evoke our appreciation, a few objects found very recently advance our knowledge of this civilization. Gamesmen with heads of a ram, and[38] ox are indeed interesting in themselves, but also take back the antiquity of similar pieces in the game of chess. For all we know, these gamesmen might belong to the game of chess, or a game very similar to it. A game board for such a game has been recovered from the Royal Graves of Ur.[39]

Instruments (Pl. IX, Fig. 68A).

Well-aligned streets and houses could not have been built without some precision instruments like a foot-rule and a compass. Now fortunately a small measuring rod of ivory,[40] about 7 in. long, graduated along the upper margin, each division about 1·7 mm.[41] has been found and a peculiar object like a *yoni* (if looked from one side only), but identical in shape on all the four sides, may be a compass for measuring angles. With these also may be noted terracotta plumb-bobs of different sizes with or without vertical rods.

Important tool is a twisted copper or bronze drill. Its occurrence at so early date is of great moment in the history of civilization.

Horse? (Pl. X, Fig. 69a).

The occurrence of a terra-cotta figure of a horse[42] or horse-like animal—the thick, short tail is unmistakably that of this animal, whereas the face and head are very much like it—is very significant. If found from the mature Harappan deposits of Period I,[43] then all the arguments regarding the authorship of the civilization based on the existence or non-existence of horse in this Indus Civilization will have to be revised, unless of course, the animal is not a horse, but onigar—wild ass—which is still surviving in the Little Rann of Kutch and north-west Saurashtra.[44]

37a. This may be compared with that of the Kalibangan bull.

38. *I.A.R.*, 1959-60, pl. XVI, A.

39. WOOLLEY, LEONARD, C. *Ur of the Chaldees*, pl. V(a) and WOOLLEY, C. L., *Ur Excavations*, Vol. II, "The Royal Cemetery" plates 95-98.

40. *I.A.R.*, 1959-60, pl. XIIIB.

41. *Ibid.*, pl. A, second row from tip, centre.

42. *Ibid.*, pl. XV, E.

43. Shri RAO kindly tells me that one is from Period I and the other is unstratified.

44. This suggestion was made by Professor F. E. ZEUNER and later he and Dr. B. SUBBARAO specially went to see the onigars in their present natural habitat.

Cemetery

The discovery of the cemetery in the south, on the lower part of the mound, almost level with the surrounding plain confirms once again our views regarding the methods of disposal practised by the Harappans.

Till early 1960, some 17 graves or burials had been found. Stratigraphically, *it appears*, these are assignable to Phase III-V, that is the closing part of Period I and the whole of Period II (which has only one phase viz. Phase V).

The method of burial seems to be simple : a fairly large pit was dug and the body put in a north-south direction with the head to the north, placed on a slightly raised ground, and the face in some cases turned to the east, exceptionally east-west. But in one case (Phase III, Period I), the pit was lined with mud-bricks, which suggest that shrouds, coffins or built-in chest-like contrivances were probably in vogue. It may be recalled that at Harappa, WHEELER found the traces of a wooden coffin and the bodies covered by a reed-shroud.[45]

In 1955-56[46] three instances of earthen pots containing crushed bones, some pottery and a carnelian bead were noticed at two places in the excavation. It is difficult to say whether these are examples of urn burials and if so of children who were very often buried in pots right in the houses.

Normally each pit contained one skeleton, but in three cases, all of Phase III, two bodies were placed side by side. *(Pl. X, Fig. 69)*.

Satī

This is indeed an interesting, nay remarkable, exception but cannot be called a *Satī* as Shri RAO thinks.[47] For the practice of *Satī* connotes a very highly specialized conception—voluntary self-immolation by the wife after her husband in the same funeral pyre. Thus burials are automatically ruled out, and would rather suggest a practice which was in vogue in Iraq or Mesopotamia viz. ceremonial burial of the wife or servant or, better say, dependents after the husband or the master. Thus to describe the Lothal twin burials as *Satī* is not proper. It is an anachronism.

These three twin-burials were devoid of any grave goods—mostly pottery —because possibly there was no room. But the single graves were provided with a number of pots,[48] though very often[49] (when disturbed) a single dish-on-stand and a vase with round base or a high-necked jar only are found.

New Cultural Elements

Period II at Lothal is not only remarkable for the general decadence of the Harappan way of life, but for the appearance of new pottery, shapes, designs and blades of jasper and agate. The last two provide a probable explanation for the

45. *A.I.*, No. 4, 1947, pp. 87-88. Burial No. 5 in Cemetery R. 37 found in 1946.
46. *I.A.R.*, 1955-56, p. 6, pl. VII B.
47. *I.A.R.*, 1958-59, p. 14.
48. *Ibid.*, 1958-59, p. 15, pl. XX, A.
49. *I.A.R.*, 1959-60, p. 18.

deterioration in the Harappan Culture. Flint blades have uniformly characterized the Harappan Civilization wherever it is found, even as far as Alamgirpur, and Lothal. At both these places flint is not locally available. It must have been imported from Sukkur and Rohri—an inference which can be fairly well established if the specimens from both the areas are found to be identical on petrographic examination. This source seems to have been stopped for some reason. The newcomers—influence or people—used instead blades of another fine-grained material, jasper, chalcedony, agate—a feature which marks *all* the later Chalcolithic cultures of Saurashtra including Rangpur, Rajputana, Central India and the Deccan (except Karnatak viz. Maski). Though the technique probably remained the same, the blades are smaller in length and breadth because the cores are small, much smaller than those of Sind.

This new influence seems to have spread or arrived gradually—almost infiltrated—both at Lothal and Rangpur. But before it could establish itself at Lothal, the latter was destroyed by severe floods and abandoned. Rangpur continued to exist, but in a different form.

Who these new people were we do not know. Nor we know, whether the contact with Sind was stopped, because in the latter itself the Harappan Civilization was being destroyed by nature and man. However, a guess may be hazarded. Three terra-cotta horses were found last season (1959-60) at Lothal. But if they belong to Period II,[50] then the horse seems to have arrived with the new elements. It also appears in a small terra-cotta fragment[51] and in a stylized painting[52] on pottery from Rangpur.

Rangpur

Rangpur in north-eastern, Rojadi in Central, Somnath or Prabhas in the sourthern, and Lakha Bawal-Amra—in western Saurashtra carry forward the story interrupted at Lothal. These are but a few wellknown sites. As mentioned earlier, each is representative of a cluster[53] of Harappan and later settlements in Saurashtra.

The topographical features of Rangpur[54] are not much different from those of Lothal from which it is 30 miles to the north-east. Situated on the Bhadar river in the former Limbdi state, it is about 3 miles from Dhandhuka Railway Station. Often tapped but not sufficiently fully, we have so far no clear picture of the various town or village plans or houses. However, the culture sequence it provides is interesting. Three main cultural periods have been observed. The earliest is quite significant - microliths in a sandy river deposit. Over this took place the mature or probably a late phase of the Harappan. It exhibits all the characteristics typical of this civilization - brick structures, drains, mud brick fortification (or rampart?), pottery, ornaments, tools, weapons and weights. Yet so far the seal or sealings and figurines of mother goddesses etc. have not yet turned up. Among the pottery shapes and designs is a bowl with a low stand

50. But see footnote obove, p. 167.
51. Dikshit, M. G., *op. cit.*, pl. XVII, p. 51, and other earlier references.
52. *Ibid.*, pl. XII, 1, p. 41. (It has been described as a palm " frond " design, but Professor Mallowan on seeing it with the writer in the Institute of Archaeology, University of London, in 1951, immediately said that the design looked like a horse's head with mane).
53. *I.A.R.*, 1953-54, p. 7 and 1954-55, p. 11.
54. For sites near Rangpur, see *I.A.R.*, 1954-55, p. 59 and 1956-57, p. 80.

and a peacock painted in black over a red surface.[55] While the design is typically Harappan, the ringed-base seems to herald later features noticed in Period II.

Without apparent signs of destruction by flood, fire or force in Period II, one witnesses new pottery fabrics, shapes and designs. The earlier brick houses seem to give place to those of mud-brick. The blades are of jasper etc., instead of flint.

New cultural elements seem to have taken a peaceful possession of Rangpur and mixed with the already existing culture. Even this is given up in Period III. Bowls with fine red lustrous surface, thin walls and a short solid stand are the striking feature of the pottery.[56] These and others are painted with highly stylized deer motif[57] "chair-like legs and wavy horizontal horns"- the buckranian,[58] and a design which though described as palm "fronde" is in truth a horse's head with mane.[59] Alongside this is another pottery, a black-and-red ware with paintings in white.[60]

Rojadi and other sites

Rojadi and Adkot[61] on the Bhadar river, 34 miles south and 30 miles south-east of Rajkot and Pithadia,[62] a further 10 miles away tell a slightly different tale. The first had a protection of large boulders - quite a new feature in the Harappan - while the houses of mud and mud-brick stood on a specially built 2ft. high mud platform, capped by rammed earth and lime. The excavator has divided the occupation into three phases, A,B,C. While A is said to be typically Harappan on account of the pottery, ornaments of gold, faience, semi-precious stones and copper tools[62a] etc., the presence of microliths of chert - blades, trapezes and lunates - suggests an earlier phase or the advent of a later culture in which flint was replaced by jasper and chert. This phase was destroyed by fire. The phase B was not much different. But in it appear new pottery fabrics - some buff ware and still fewer sherds of black-and-red ware with paintings in white.

Rubble structures appear in phase C and alongside a few Harappan shapes; the characteristic Prabhas ware also becomes current.

Pithadia had in the later phase the lustrous ware of Rangpur.

Thus already a commingling of several cultural forces is evident in the heart of Saurashtra.

55. *Ibid.*, 1954-55, pl. XII A.

56. DIKSHIT, *op. cit.*, pl. II and *I.A.R.*, 1954-55, pp. 11-12.

57. *Ibid.*, and *I.A.R.*, 1954-55, pl. XII, B.

58. *Ibid.*, 1954-55, pl. XII B.

59. DIKSHIT, *op. cit.*, pl. xii, 1. See above f.n. 52.

60. DIKSHIT, *op. cit.*, pl. I. and *I.A.R.*, 1954-55, p. 12.

61. *I.A.R.*, 1957-58, p. 18, and 1958-59, pp. 20-21, figs. 9-10. Rojadi is a very interesting site. For some reason the ancient habitation (like Patna) extended only laterally along the river for nearly 15,00 ft, but had a width of only 2,00 ft. In addition to the encircling wall of stone boulders, at one place is noticed a stone circle, suggesting a burial. Further on the river we find tools of the Late and Middle Stone Age and as said earlier those of the Early Stone Age can be expected. Thus Rojadi, if properly surveyed, will provide a unique sequence of cultures.

62. *Ibid.*, p. 20.

62a. The copper-axe from here is almost identical with the two displayed in the Watson Museum at Rajkot. After an examination of both, it appears to the writer that all the three come from the same source, either Rojadi or some other Harapan site in the region.

Somnath (*See Fig. 76*)

In the south-west the site known as Somnath or Prabhas Patan has been very partially excavated. But the area is very extensive. A group of five mounds known as Nagar, stretched over the Hiranya river for some 3000 ft. These are two miles east of Prabhas Patan, while the famous temple of Somnath stands[63] close to it.

It appears from the second excavation by the late Shri P. P. PANDYA that the entire occupation debris may be divided into six periods, each period having several sub-phases. Since the N. B. P. occurs in Period III B, only the earlier periods interest us. Crude sherds of grey and red-slipped pottery with incised decoration and blades of chalcedony found in a layer of sand and gravel characterize Period IA. Late Harappan pottery, mostly painted, occurs in profusion in IB. It is now that the typical "Somnath or Prabhas" bowl (with incurved and bevelled rim with panelled patterns) as well as a few sherds with paintings in brown on a white or creamy surface make their appearance. This is indeed an important development, for three distinct pottery groups are present.

A new element enters in Period II viz. a lustrous red ware (of the Rangpur type),—but copying the handled bowl—besides the dish-on-stand and carinated bowl of the Harappan type. A rubble pavement is associated with this phase.

Iron and black-and-red ware in abundance, followed by the N.B.P. (with a very fine Grey Ware-like sherd) in a later phase, seemed to show the priority of the former in Saurashtra as at Maheshwar, Nagda, Ujjain, and now Sonepur, near Gaya, besides Bahal and Daimabad in the Deccan. But how much earlier is the question. Will it mean a century or much more ?

Amra

Amra and Lakha Bawal,[64] nine miles east of Jamnagar, District Halar, along with some 20 sites repeat the Rangpur sequence. Period I seems to be pure Harappan, though at Amra black-and-red bowls are also reported alongside. The red polished ware (probably identical with Rangpur lustrous) and a coarse black-and-red ware occurs in Period II. It is further distinguished by the presence of a gold ornament—ear-ring or head ornament—with exquisite filigree work.

In review then Saurashtra presents a very interesting phenomenon. First the initial arrival and spread of the Harappans. This was certainly a maritime one, yet on our showing, from Kutch straight to Lothal or some other site on the eastern coast, but not round the peninsula (or the island?) and up the Gulf of Cambay to Lothal. There is a possibility that an early Harappan site might be found on the Western Coast. Whatever be the exact route, the Harappans moved into the interior and spread in all directions. This might be a natural further colonization in the wake of the destruction of other settlements in Sind and Lothal etc. Wherever they went, they carried their art of pottery.

63. *I.A.R.*, 1956-57, pp. 16-17, pl. XVII and *I.A.R.* 1955-56, p. 7, also mentions the occurrence of a copper celt, and 10,000 minute steatite beads in a single pot. But these further refer to the association of black-and-red ware in Period I. The later report is here followed.

64. *I.A.R.*, 1955-56, p. 7.

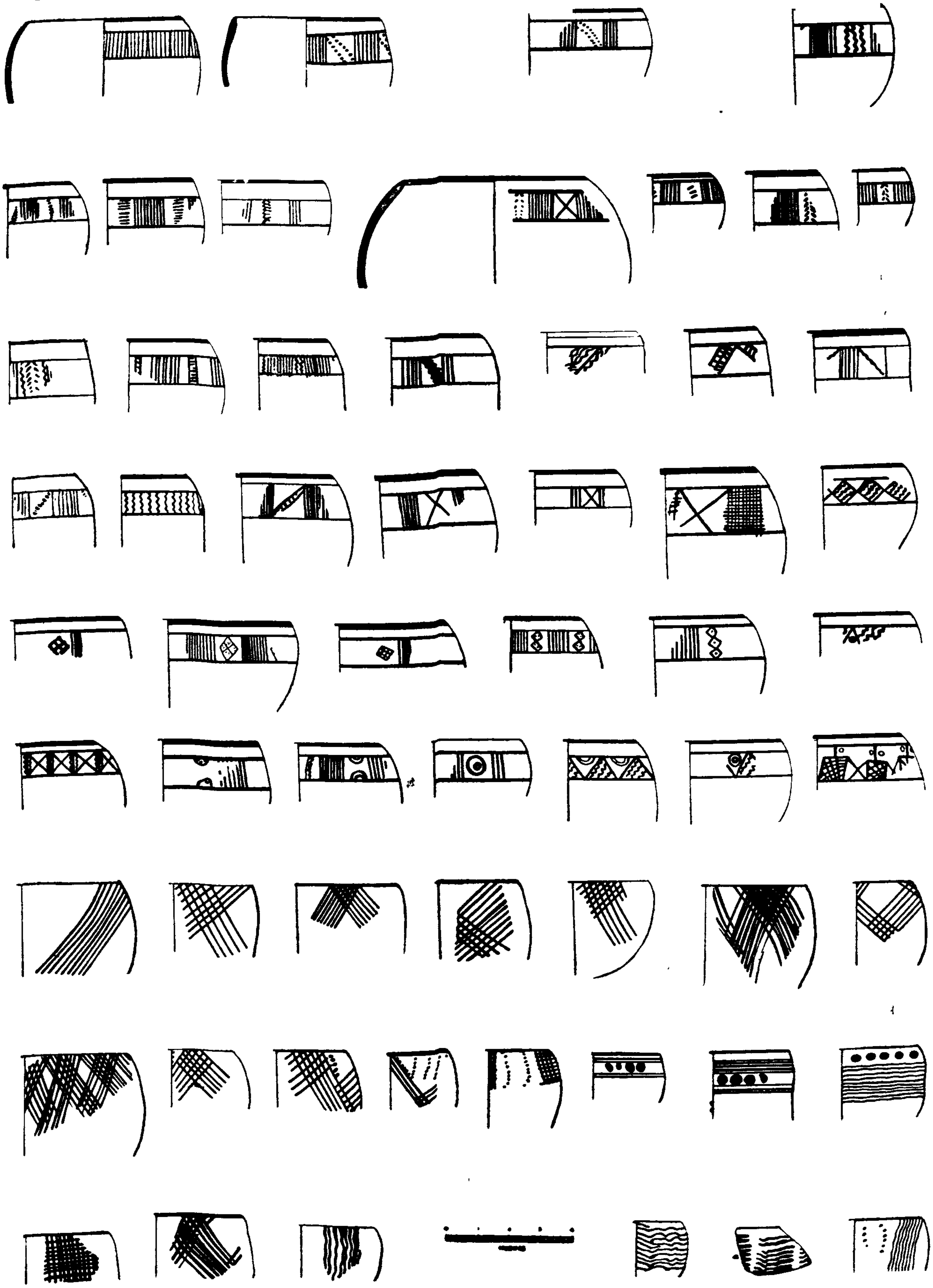


Fig. 76. Types and Designs in Somnath or Prabhas Ware.

But very soon three other elements (shall we say people?) representing the lustrous Red Ware, the black-and-red ware with paintings in white and the Prabhas Ware came on the scene. Whence? We do not know. But they all intermingled and what is definite and significant is that none of them carried the art of building in baked brick and none was literate. Even in other arts and crafts they were deficient. Thus Saurashtra once again sank to a pastoral-cum-agricultural stage, after the sudden imposition of urbanization by the Harappans.

Significance

A few new features as well as the significance of the widening horizon of the Indus Civilization may now be briefly brought out. The Indus Civilization has come to the frontiers of Bombay and it is quite possible that with further explorations we may be able to go along the coast still farther southwards. If this prophecy turns out to be true, then at least one part of Rev. Father HERAS' forecast will be proved. He had said long ago, even before he completed the study of the seals of the Indus Civilization,[65] that this culture had spread from the south all along the West Coast over Saurashtra, Sind, the Panjab and then gone over to Western Asia as far as Crete and the Mediterranean countries.

But to prove that the origin of this civilization lay further south and then went northwards, we have to find still earlier cultures in South India showing a distinct affinity to the Indus Civilization. Unfortunately this is not so according to our present evidence, and, therefore, Father HERAS' hypothesis of this being a purely indigenous culture remains unproved. However, I must say, as I have been saying, that his is so far the only attempt by which archaeological evidence from Western Asian countries and Indian sources is harmonised. How far this will be in conformity with the final reading of the Indus seals one cannot say. But very often working hypotheses have led to some kind of truth and it is possible that Father HERAS has indeed struck upon a partial truth.

Again the link between India and Western Asia has also been supplied by the discovery of Indus-like seals[66] in the island of Bahrain in the Persian Gulf. From the distribution pattern of this culture in Saurashtra and the likely possibility of there being a port at Lothal and elsewhere in Saurashtra, it is quite possible now that the Indus Civilization was a maritime one and not merely land-locked. If Indus ports are adequately explored, as WHEELER suggests, then some more tangible links with Western Asia might be had.

Rajputana—A Sea (?)

In this connection I also want to tell you of the researches of one chemist, Dr. GODBOLE, who was till recently Development Commissioner in Rajputana for some years. He took a number of samples from the borings in the wells in Rajputana and has proved quite conclusively that the salt that is to be found in the wells of Rajputana is sea salt and not merely surface salt that has been

65. HERAS, H., *Studies in Proto-Indo-Mediterranean Culture*, Vol. I, Bombay, 1953.

66. *Illustrated London News*, 4th and 11th January 1958, and *Antiquity*, Vol. XXXII, 1958, pp. 243-46. The latter also publishes views of Col. GORDON and Sir MORTIMER WHEELER. WHEELER states on the authority of Professor MALLOWAN that, though these do not show clear affinity with the Indus seals, still nothing like these Bahrain seals has been found in Syria or Iraq. The seals thus are India-oriented. In his latest book *Early India and Pakistan*, p. 111, he calls them the "Persian Gulf Seals."

blown over by the south-west winds over the desert. From this he further infers that Rajputana was a sea during the time of the Indus Civilization and perhaps much earlier. This also supports the theory of some geologists that during a still earlier geological period an arm of the Arabian Sea went along where the Vindhya hills now are and it is this sea which has given us the beautiful sandstone formations running from west to east in Central India. This sea retreated later and Rajputana became almost a desert. This is a very interesting theory and I wish that some more steps are taken to prove it. If all these explorations and excavations prove the existence of a Rajputana Sea, then the Indus Civilization might have come *via* this sea and not *via* the Arabian Sea round the west coast of Saurashtra but immediately to the north-east coast of Saurashtra which is now formed by the Nal Lake. The latter was then under the sea. This also explains the existence of a mature form of Harappan Culture at Lothal. For, from here, it seems to have spread further southwards.[67]

Ports on the Makran Border

In fact, a recent 500-mile survey of the Makran coast from the Pakistan-Iran border eastward to Ras Malan by George F. DALES, Jr., and his colleagues[67a] on behalf of the University Museum of Pennsylvania, seems to confirm the impression that Sutkagen-dor could have been a port on the Arabian sea or very near it. They also discovered another Harappan site Sotka-koh ("Burned Hill"), about nine miles north of Pasni in the Shadi Kaur Valley. "This site could never have been on the sea coast," "but would have been in the ideal strategic position to control traffic between the coast and the interior."

Sutkagen-dor and Sotka-koh were no ordinary ports. These were fortified hill-forts as well. Thus these two Harappan settlements on or very near the ancient Arabian Sea coast, each stationed at the entrance to a major route from the sea to the interior controlled much of the economic life of southern Baluchistan as well as the intermediate outposts for coastal sea trade with the west, and (we may add) also with coastal Gujarat, if necessary.

DALES supplies some interesting information about these sites and how possibly they lost direct contact with the sea. Sutkagen-dor is situated on the eastern edge of the vast alluvial plain of the Dasht River. The citadel is built on and around a natural rock which is steeply inclined. Upon its jagged base is constructed a massive fortification wall of semi-undressed stones. This encloses a large area ("four foot-ball fields"). Varying in height and thickness, at one point it is nearly 24 ft. broad at the base. The inner face of the wall is slightly battered, whereas the outer is sloping. There are also signs of mud-brick platform (about 7 ft. thick) as in many Harappan sites. Traces of bastions or towers were also observed. Stratigraphic evidence of three major occupational phases was available. Within the citadel, stone foundations of regularly laid out structures are visible.

It is felt that the principal entrance to the citadel was in the south-west corner, where there are remains of a sizeable gateway. Between the towers

67. Shri RAO in his letter of 7-12-1960 accepts my suggestion, regarding Saurashtra being an island, and Lothal being directly occupied from Kutch, but thinks that the later movement was round the coast of Saurashtra. This can only happen if owing to climatic, geological and other reasons the direct route was closed.

67a. Abridged from *Expedition*, Vol. IV, 1962, p. 3 ff. A more detailed account is published in *Antiquity*, June 1962, pp. 86-92.

guarding the entrance, there was a five-and-a-half feet wide and 40 feet long passage.

The now fashionable "lower town" seems to have been located along the eastern side of the site.

Various pottery fabrics indicate that a mixed Baluchi and Harappan population lived on the site.

Sotka-koh on the Shadi is said to be identical in size, appearance and geographical location, built on top of a jagged natural outcrop, situated in an alluvial plain along the eastern side of a wide valley. A 1600 ft. stone wall was traced along the eastern edge of the rock, but the rest of the site is badly eroded.

The pottery is Harappan.

Three natural forces, according to Dr. DALES, have altered the geography of these hill-fort ports : continuous coastal uplift, silting up of the mouth of the rivers Dasht and Shadi and the steady building up of the beaches by sand deposition through wave action.

Ancient Name of West Coast or Indus Civilization

Another interesting evidence is that what is found in the Babylonian texts. These consist of inscriptions of the kings of Akkad and lexical texts. Among these Mr. LEEMANS has found two words viz. '*Magan*' or '*Makkan*' and '*Melluhha*'[68]. He identified *Magan* with Makran in Baluchistan and *Meluhha* with Western India including Sind and Saurashtra. From Meluhha, it is said in these texts, that carnelian and special kinds of wood were imported all along the sea by the Babylonians. If this inference of LEEMANS is correct, then we find for the first time an ancient name for this part of Western India. What is now necessary is that we should read our ancient literature - *Puranas* and things like that - and find out if some such words comparable to the Babylonian one can be found in them, which from thier geographical position would suit the context.

End of the Indus Civilization

Sir Mortimer Wheeler's excavations at Harappa and Mohenjodaro[69] indicate that this civilization was not non-violent as it was believed by MARSHALL, but it had fortifications around the important buildings called 'acropolis'. And from this it is further inferred that these cities are indeed the *puras* of the pre-Aryans. This is a very tempting hypothesis. But unfortunately we have not found anything "Aryan" on the ruins of the Indus Valley Civilization, whereas the so-called fortifications were more likely protection against recurring floods. The Cemetery H at Harappa gives us a kind of culture which as shown by Shri Lal[70] does not immediately over-lie the ruins of the Indus Civilization and

68. LEEMANS, W. F., "The Trade Relations of Babylonia," in *Journal of the Economic and Social History of the Orient*, Vol. III, April, 1960, pp. 20-37. Professor GLOB, actually identified Meluhha with the Indus Civilization itself. *Illustrated London News* January 11, 1958, p. 55. OPPENHEIM's review "The Seafaring Merchants of Ur" in *Journal of American Oriental Society*, Vol. 74, (1954), p. 6, ff, is very useful.

69. WHEELER, Sir MORTIMER, *Indus Civilization*, (Cambridge 1953).

70. LAL, B. B., "*Excavations at Hastinapura*" in *A.I.*, Nos. 10-11 (1954-55), pp. 151, f.n. 1,

thus it does not seem to be of the Invaders.[71] Sir Mortimer therefore has not pressed this point in his latest book.

However, our studies of pottery from Central India, Bikaner and then of the Cemetery H indicate that there is some similarity between the pottery of these regions and it is possible that all these belong to groups which were related to one another in some way. In particular, a big painted lid covering a huge burial urn from Cemetery H (now exhibited in National Museum, New Delhi) appears to be identical[72] in fabric and decoration with the one from Rangmahal (examined by me and Dr. SUBBARAO with the great kindness of Shri A. Ghosh). Though the latter is non-stratified, it points to the fact that the Cemetery H pottery types and fabrics are not confined only to Western Panjab, but can also be found in Rajputana. Thus one of the arguments against WHEELER's Aryan invasion theory can be partly met. For what happened in the Panjab seems to have later taken place elsewhere.

Again the generally accepted view about the decay or destruction of the civilization owing to progressive desiccation in Sind and Baluchistan has been questioned, though it has been admitted that man might have brought about a change in the environment by over-cultivation and removal of forest cover. Regarding the past climate in the Indus Valley it has recently been shown by RAIKES[72a] and DYSON, Jr. and also FAIRSERVIS[72b] that the inferences based on hydrographical, zoological, botanical, archaeological and architectural grounds, do not support the hypothesis of progressive desiccation either in Baluchistan or in the Indus Valley. They argue that " no climatic change of any major proportion has occurred." To this may be added one more argument that the houses in Sind and Bikaner continue to be built without windows, as in Mohenjodaro. This is to shut out heat and dust.

Thus every year more and more information is being obtained about the Indus Civilization. But the time has not yet come, when we can say something definite about it, and I am sure that unless a very well-planned attempt is made to get such information, we shall have to remain content with these tit bits. What is required is a planned exploration in Bikaner followed by a large-scale excavation and then alone we shall be able to solve the problem of the relationship between the Indus Civilization and the later Chalcolithic cultures of the Gangetic Valley, Rajputana, Saurashtra and Central India.

Origin?

If we do not know the exact cause or causes of the destruction of the Indus Civilization, do we know anything about its origin? No. But the work of FAIR-

71. *Early India and Pakistan*, pp. 113-14. He has on the contrary described the decay as gradual, a fight against nature—recurring floods—and partly desiccation. Thus " Mohenjodaro was wearing out its landscape."

72. After writing this, in the subsequent visit to Delhi both these lids—one from Rangmahal and the other from Cemetery H—were brought together (with the permission of Shri GHOSH and the authorities of the National Museum) and compared. It was then found that though the similarity in fabric, type and decoration were close, there were a few differences. But one can safely say that the Rangmahal type can be derived from that of the Cemetry H.

72a. In *Am. Anthropologist*, Vol. 63, 1961, pp. 265-81. For FAIRSERVIS see below.

72b. *American Novitates* (American Museum of Natural History), No. 2055, 1961, pp. 2-4.

SERVIS[73] and BEATRICE de CARDI[74] in Baluchistan, particularly the former, has given us a faint idea of the earliest pastoral-cum-agricultural cultures in the Quetta Valley. And it is thought advisable to summarise this, before discussing the question of the origin.

Early Food-Producing Cultures of Baluchistan or Indo-Pakistan Border

Prior to this work we had only studies of pottery collected by STEIN, PIGGOTT and others and the excavations in the cemetery at Nal by HARGREAVES. FAIRSERVIS' work was confined to small excavations in the Quetta valley, and the adjoining eastern area viz. surveys in the Zhob and Loralai Districts of Baluchistan.

Baluchistan lying between the higher inland plateau of Central Asia and the low flat plains of Sind is indeed a transitional zone. The region is mostly mountainous. The Quetta valley itself is very narrow, not more than six miles in width and running north-south. Since its physiographical features shut out the monsoon winds from the south and east and admit, on the other hand, the winds from the north-west, the climate is more akin to that of Sind and the Panjab. This has had an important bearing upon the growth, development, decay and affinities of prehistoric cultures of Baluchistan.

The district of Quetta was extensively inhabited in prehistoric times. The earliest of these inhabitants, some 5,500 years ago (Kili Ghul Mohammad I (C-14 date 3100-3500 B.C.), lived in small huts, at first, perhaps of mud and later of mud-bricks. They had no pottery, but probably used skin bags and had basketry. They had bone and stone tools. It was thus an extremely primitive pastoral society which depended upon plentiful forage and water for their flocks in the central portion of the valley. During the next phase, Kili Ghul Mohammad II, probably because of the fertility of the soil, abundant water supply and arrival of people and ideas from Iran, we find a fine wheel-made pottery, implying the beginning of agriculture and even increase in population. This pottery, black-on-red, might have been locally made or brought in by traders from Iran. This stimulus from the west is also seen in a fine buff wheel-made ware having decorative styles of the Halaf type.

Probably these influences also introduced copper to the inhabitants with the help of which the drainage was improved in southern part of the Valley to enable its settlement.

From the size of the sites, it is estimated that the villages were large, the houses small and the passages between them irregular; doors moved on stone sockets, hearths were sunken and pottery bread ovens were utilized in every home. Flat stones and pebbles were employed as foundations for the mud walls. The predominant economy was agriculture (probably wheat and barley though so far no actual grains have been found). Herds of sheep, goats and cattle must have been kept as before. The emphasis on the former is perhaps indicated by small Mother Goddess figurines, which are regarded as symbols of a fertility cult.

73. FAIRSERVIS, Jr., WALTER, A., "Excavations in the Quetta Valley and Archaeological Survey in the Zhob and Loralai Districts, West Pakistan" in the *Anthropological Papers of the American Museum of Natural History*, Vol. 45, pt. 2, pp. 169-401, and Vol. 47, pt. 2, pp. 277-448, respectively. These have made the earlier studies of surface pottery by McCOWN, PIGGOTT and GORDON obsolete.

74. BEATRICE de CARDI, "Fresh Problems from Baluchistan," *Antiquity*, Vol. XXXIII (1959), pp. 15-28.

In the third and the last phase, owing to the increasing contact with the Indus valley, the original Baluchi Culture inspired by Irani migration and influences underwent a radical change. Both the pottery and houses exhibit this in no uncertain way. The former now displays typical Indian designs such as the Brahmi bull and the pipal leaf, whereas the latter are equipped with bricks and drains. But the Iranian influence persists, and instanced by the ibex and the desert antelope. Agriculture naturally received a great impetus.

However, instead of producing a large homogeneous culture or civilization in the valley, a number of localized cultures came into existence, probably because of regional politics, economic outlets, and social affinities as it has happened so often in India and the East.

At present in the absence of other evidence we only see the different ceramic traditions, but there might have been probably minor variations in ritual, and crafts from region to region.

It is not only in Northern Baluchistan that this gradual Indianization of the original Baluchi cultures has been observed. Similar phenomenon was seen in the district of Las Bela[75] in South-Eastern Baluchistan on the border of the Arabian Sea. Here north of the town of Bela area string of practically contiguous sites on both sides of the Porali river; structures were made of boulders laid in tiers, wherein one could easily discern walls, floors, ramps, ancient "streets." The group of ruin is called Edith Shahr Complex.

Though no excavations have yet been carried out in any of the sites, two phases—an earlier and a later—have been suspected on the evidence of pottery. The former reveals Baluchi traits, the latter Harappan. Most interesting, however, are square or rectangular structures built in receding stages or steps, some of these are 30 ft. high, their tops made of burnt or mud bricks. If these are really remains of ziggurat, then we shall have some definite evidence of the penetration of Mesopotamian culture in Baluchistan and Sind. Other curious structures which abound in the region are megaliths, which resemble "avenues" and the like.

Origin of the Indus Valley Civilization

Little precise knowledge is available at the time of writing (October 1961) on the origins of this civilization, though in the last 10 years or so, evidence has been forthcoming from Sind, the Panjab and Northern Rajasthan as well as from Baluchistan and Indo-Iranian borderlands about its earlier antecedents. This knowledge supplements in a way that previously obtained by the explorations of N. G. Majumdar, Sir Aurel Stein and Hargreaves in Sind and Baluchistan respectively, and studied in detail by Piggott[76] and Gordon.[77]

It is now increasingly realized that there were at least two strains in the make up of the Indus Valley Civilization, the origins of which have to be separately traced. One element was Iranian, which had come to Sind through Baluchi-

75. Fairservis, Walter A., *Illustrated London News*, August 26, 1961, p. 324.
76. *A.I.*, No. 1, 1946, pp. 8-26, No. 3, 1947, pp. 131-42.
77. Gordon, D. H., *Prehistoric Background of Indian Culture*. However, this was all surface evidence, almost all pottery, and of little help in understanding the life of the people.

stan (and Afghanistan?), after having given birth to a number of village cultures there. The other might be called "indigenous" or the Indus at the moment. While a little more is known about the former owing to the work of FAIRSERVIS in the Quetta Valley (described above), of the second a few earlier antecedents have been revealed first by the excavations at Harappa in 1946, then at Kot Diji, 25 miles east of Mohenjodaro, and at Kalibangan in the Saraswati valley in the former Bikaner State. Possibly such traces might be found in South-Eastern Baluchistan as well, where in the Las Bela District, Harappan and other contemporary cultures have been noticed.[78]

These do not explain the origin of the Indus Civilization, as WHEELER has said,[79] but give a few earlier aspects of the material culture, such as pottery, including "terracotta cakes".

The origins have got to be searched by a systematic planning, by an excavation of a site like Dabar Kot in the Zhob Valley in Northern Baluchistan or of Judeirjodaro, 18 miles north of Jacobabad in the Indus plains. In the former, the Indus Culture is believed to have been sandwiched between an earlier and a later culture and is thus likely to yield the desired data.

In the absence of positive data naturally guesses and speculations prevail. It is now suggested that this most extensive civilization of the ancient world did not slowly evolve or grow, but developed suddenly by a genius whose mind was fertilized by ideas of town planning which were in the air, and known earlier in Mesopotamia. Arguments like this cut short any further questions as to how and when the Mesopotamian (Iranian) influence reached the Indus Valley and also the question why such a planned development of cities built entirely of baked bricks did not take place in Mesopotamia, though geographical and other factors were almost identical? Anyway, we should be thankful to this town planning genius and to the authors who first acknowledged it.

Let us now revert to the two outstanding traits in the Indus civilization, which have now been separately traced to an earlier phase.

The first is pottery. A fine, dark, purple-red ware with dull matt surface decorated with black bands round the rim, was found in pre-defence deposits at Harappa in 1946.[80] Similar pottery is found in the lower, pre-Harappa leavels at Kot Diji[81] and along with others which is decorated with loops and wavy lines. It is known as Kot Dijian culture. Similar pottery is now found at Kalibangan[82]. At all the three sites the pottery is wheel-turned. It may be recalled that Amri[83], south of Mohenjodaro, had also yielded some such pottery much earlier. However, it had also given a distinctive[84] pottery which had buff, cream or pink background. Over this were painted (perhaps after firing) bands of reddish brown round the neck and geometric designs in black or chocolate. In effect, the pottery was

78. FAIRSERVIS, WALTER, A., *Illustrated London News*, August 26, 1961, p. 324.

79. WHEELER, Sir MORTIMER, in *The Dawn of Civilization*, London, 1960, p. 247. The subsequent discussion is based on this account.

80. WHEELER, in *A.I.*, No. 3, p. 91, figs. 8-9, and pl. XL-XLII.

81. WHEELER, in *Dawn of Civilization*, p. 248.

82. Seen at the site owing to the kindness of Shri B. B. LAL, who first drew our attention to it.

83. MAJUMDAR, N. G., "Explorations in Sind," *MASI.*, No. 48, p. 24.

84. *Ibid.*, pp. 27-32, and pl. XVIII, figs. 1-32.

polychrome; the designs include chevrons, lozenges, zig-zag or "sigmas". Beakers and rimless bowls are characteristic.

Now both these—the pre-Harappan Kot Dijian and Amri—pottery fabrics are found to be related or similar to wares of hill cultures of northern and southern Baluchistan respectively, which can be ultimately derived from Iran. Thus these indicate the Baluchi-Iranian influences in Sind, which might not be the direct ancestors of the Indus Civilization.

However, Kot Diji as well as other sites in Las Bela[85] on the Baluchistan sea border reveal that the Indus pottery with typical scale-pattern and terracotta cakes were already existing with the Baluchi cultures in several parts of Sind as well as Baluchistan. Further explorations might bring many more to light eastwards in Rajasthan.

If Kot Diji with its earlier settlement and fortifications of mud brick on stone foundations is not to be regarded as "parental" to or ancestor of the Indus Civilization, but one brought within its ambit then its true antecedents have to be looked for primarily in Sind.

Fairservis who has been exploring in Baluchistan for the last few years has fully realized the action and reaction of the Baluchi and Indus Cultures. After his latest field survey he says,[86]

> " So far as we know, settlement on the much-scattered strips and patches of fertile soil, which occur in this arid region, began at least in the fourth millennium B.C. The earliest settlers were of Iranian origin and depended for their existence on grain agriculture and the herding of sheep and goats. Though there were strong influences from developing cultures in Iran, it is obvious that in the successive complexing phases of prehistoric Baluch village culture a process of Indianisation was at work. This process would appear to reflect a parallel cultural development in the Indus Valley in pre-Harappan times which achieved such success that it had a strong influence on the farming cultures of Baluchistan. The demonstration of these influences is found, for example, in the increased use of the humped bull, in the appearance of decorative elements, such as the pipal leaf on painted pottery and the elaboration of architecture into formal and characteristic structures. In turn, such concrete elements of Indianisation in Baluchistan may be symptomatic of the development of early Indian civilization. It seems increasingly clear that the Harappan civilization is the last and most elaborate phase of long cultural evolution in the Indus Valley. In Baluchistan its equivalent is the Kulli culture, which, in its latest phase at least, is contemporary with the full Harappan civilization as known at Mohenjodaro in Sind."

In his latest interpretation of the new and old data, Fairservis rules out (as Dyson and Raikes cited above) desiccation as one of the causes of the destruction of this civilization. He asserts that the climate of Sind and Baluchistan has not fundamentally changed in the last 6,000 years. Further, the argument from the quantity of burnt bricks is no longer tenable because in Sind, even today the Kandi (*Prosopic spicigra*) and other woods help fire bricks even harder than the Harappan and these trees grow much faster.

85. Fairservis, *op. cit.*
86. *Ibid.*

With regard to the origin and spread of the civilization, he attributes to the interaction of the earlier Baluchi (Iranian) with the hypothetical and earlier hunting, forest and agricultural cultures of Sind. Religion was one of the strongest features of these cultures. This " intensified " or acted as a motive force in its development as a city civilization. But it also made the civilization static. The civilization spread north, north-east and south, because of the economic needs of an expanding population. It collapsed or was eclipsed " because the growing population of men and cattle spread to the limits of the feasible cultivated area so that the symbiotic balance was upset when no further expansion was possible, at least within the original areas of settlement."

These are indeed very thought-provoking speculations and need to be proved by further explorations and excavations of sites in the Indus Valley and the adjoining regions which exhibit a long cultural evolution. In these due emphasis should be laid on total excavation of small village sites for a fuller understanding of the various problems.

Protohistory: *Gangetic Valley and Peninsular India*

These 20 years, nay the last ten, have witnessed a phenomenal increase in our knowledge of the protohistoric cultures of what is technically called "the Peninsular India". The large areas called *Janapadas* (*Fig. 2.*) in Sanskrit and Buddhist literature, outside the Indus Valley proper, were literally a *terra incognita* from the archaeological point of view. These presented a dark spot until they were lighted up by the strong and sudden light from the Asokan edicts in the 3rd century B.C. Thus practically the present post-partition India (or geologically the Gangetic Valley plus the Old Indian land mass upto Kanyakumari in the south) was believed to be historically blank. Of course, the Buddhist *Jātakas* did describe in glorious terms the activities of the 16 *Janapadas* stretching from Ujjain or Avanti (Malwa) in the west to Mithila (Bihar) in the east, in about the 6th century B.C., when Buddha and Mahāvīra preached in Magadha. The later Vedic literature and the Puranas, on the other hand, sang of the exploits of various Aryan and semi-Aryan tribes and the colonization by the Yadavas in Saurashtra, in Vidarbha and in the Narmada Valley. Thus our historical tradition gave ample proof of the kingdoms and peoples in what is now known as Assam, Uttar Pradesh, Madhya Pradesh, Rajputana, Maharashtra (Vidarbha), and Gujarat (Saurashtra), though Mysore-Karnatak, Andhra, Madras and Kerala were unknown, save for occasional references.

However, in the absence of any tangible archaeological evidence, we could not visualize at what stage of civilization these kingdoms were, whether they knew iron or whether they were in a Copper or Stone Age and how they stepped into the Iron Age or an urban stage. South India, it was thought on no evidence at all, had by-passed the Copper Age and reached the Iron Age in the 3rd century B.C.

This darkness which intervened between the earliest historical period and the Indus Civilization on the one hand, and between the former and the undefined Stone Ages in Peninsular India has now been dispelled, first by Wheeler's work at Brahmagiri and by the work of the Deccan College at Nasik and Jorwe. These initial discoveries, particularly those at Jorwe, supplied the clues viz. microliths of a particular nature and pottery—with which to search for the Chalcolithic

cultures in the Deccan and elsewhere. Planned surveys brought to light more and more sites in Khandesh, Central India, Malwa and Saurashtra.

In Rajasthan, Sir AUREL STEIN had already shown the existence of the Indus Valley and allied sites in the dry bed of the Ghaggar in Bikaner State. This view was confirmed by Shri GHOSH's exploration, including trial excavations in Bikaner in 1950-53 and further pointed to the extension of this civilization in the valleys of the Drishadvati. Unfortunately no report of this exploration has so far been published, nor the work was followed up by an excavation, so that the picture is still hazy. In South-Eastern Rajputana, however, traces of other Chalcolithic Cultures have been unearthed.

WHEELER,[87] while departing from India, had suggested that we in India should turn to the Gangetic Valley. For the Ganges had given us our faith, whereas the Indus had given India its name. This suggestion was indeed prophetic. For the entire Gangetic Valley, from Hastinapur, the ancient Mahabharata capital in the north-west (and beyond) to Kausambi in the east, has given evidence of a pre-Buddhist Culture. Further eastwards in Magadha (Bihar), Assam and then south-eastwards in Orissa and Andhra, stages of cultures much earlier than the urban are beginning to unfold. Barring therefore Kerala and the West Coast, south of Bombay, cultures called "Neolithic" or "Chalcolithic" (according to the nature of the remains) existed, either prior to or contemporary with the great Indus Civilization. In some regions, like the Narmada Valley, these might have immediately succeeded this civilization or been its junior contemporaries.

However, this much is certain that the rest of India, south of the Panjab and Sind was not totally blank. Small and large river valleys were dotted with a number of peasant village cultures. And it is these which served as a bridge between the later city civilization of the historic period and the earlier Stone Ages.

How did this happen? What influences were responsible for this revolutionary change? It is also asked whether some of these Neolithic and Chalcolithic cultures themselves were not introduced from outside? And if so whether these had any bearing on the geographical situation of the various regions mentioned above, or their birth and growth was uniform, irrespective of geographic conditions.

Painted Grey Ware or the Gangetic Culture (*See Fig. 72*)

Before discussing the problems of origin and diffusion of these newly discovered cultures, let us see their main characteristics. Proceeding from north to south, the first is the Gangetic Culture. Its main characteristic so far is the peculiar grey colour of the pottery met with in all the excavated and explored sites. This is often painted in black and hence is called the "Painted Grey Ware Culture" and included in the Ganges Civilization.[88] This pottery was first found at Ahichchhatra[89], District Bareilly, U.P., in 1940-44, in the lowest layers, but its full significance was not then realized. Later it turned up in the excavations at

87. *A.I.*, No. 5, 1947, p. 10.
88. WHEELER, Sir MORTIMER, *Early India and Pakistan*, p. 129.
89. *A.I.*, No. 1, 1946, pp. 58-59.

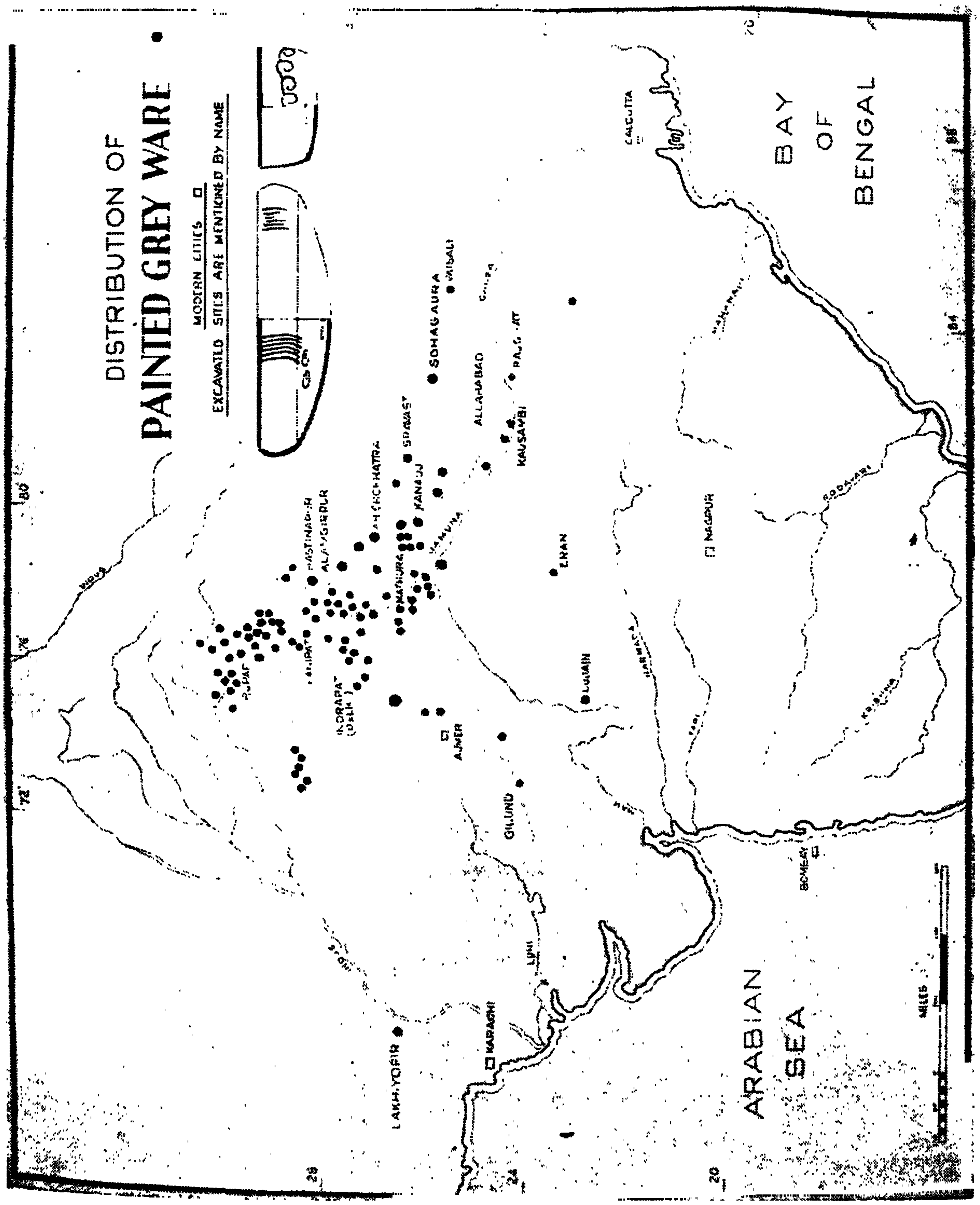

DISTRIBUTION OF
PAINTED GREY WARE
MODERN CITIES
EXCAVATED SITES ARE MENTIONED BY NAME
BAY OF BENGAL
ARABIAN SEA
CALCUTTA
SOHAGAURA
VAISALI
ALLAHABAD
KAUSAMBI
SRAVASTI
AHICHCHHATRA
KANAUJ
HASTINAPUR
ALAMGIRPUR
MATHURA
PANIPAT
INDRAPAT (DELHI)
UJJAIN
ERAN
NAGPUR
AJMER
GILUND
KARACHI
LAKHIYOPIR
BOMBAY
MILES

Fig. 72.

Hastinapur,[90] at Rupar[91] further up on the Sutlej, at Purana Quila, New Delhi, then in the core of the rampart at Ujjain;[92] in the south, at Mathura,[93] in Period I at Sravasti,[94] and in the pre-defence deposit at Kausambi.[95] Thus its stratigraphical position is now well ascertained. Its greatest concentration in the Ganga-Yamuna Doab (the Aryavarta or Madhyadesha of the *Upanishads*, the *Puranas* and the Epics) is well attested by later exploration. Occasional sherds have been found so far south as Ujjain in Central India, Chosla[96] and Gondi[97] in Ajmer and Jaipur, besides Bikaner where there were small settlements in Rajputana and in the east upto Vaisali in Bihar and in the north at Madhopur,[98] 15 miles south-west of Jallundar. These far-flung places show the contact which the Grey Ware people had with the cultures in the Panjab, Rajputana, Malwa and Eastern U.P. and Bihar. The frontiers of the Narmada and the region south of it seemed to have remained completely unaffected.

This pottery is very distinctive in its fabric, its forms and its paintings over a slate grey surface. It has generally a fine fabric characterized by a well levigated clay, very compact and free from impurities, medium-to-thin walled and fully baked. However, coarse varieties are also known. The colour, which is almost identical on both the sides varies from ashy to dark grey. This is due to the fact that the pots were baked in a kiln where the heat was gradually reduced, so that the clay did not turn red, but it was sufficient to fully bake the pots.

The shapes so far known are bowls and dishes with (*i*) straight,[99] (*ii*) convex,[100] (*iii*) carinated,[101] (*iv*) tapering and outgoing,[102] (*v*) ledged or corrugated[103] sides and with round or sagger base (*Pl. XIII, Fig. 73*). Vessels are largely wheel-made, though occasionally hand-made varieties are available. They were usually painted with a black colour, but at times in chocolate or reddish brown. A unique specimen is bichrome, having the designs in reddish brown and cream. Painting was done when the pots were "leather hard", that is sufficiently dry and before firing. The paint is matt, though the surfaces are smooth due to burnishing. The painted strokes are of unusual thickness.

The painted designs include the following: (*i*) Simple horizontal band round the rim, both inside and outside, (*ii*) Groups of (*a*) verticals, (*b*) oblique or (*c*) criss-cross lines,[104] usually on the outside, but at times on the interior. (*iii*) Rows of dots or dashes or dots[105] alternately with simple lines. (*iv*) Chain

90. *Ibid.*, Nos. 10 and 11, 1954-55, p. 13.
91. *I.A.R.*, 1953-54, p. 6.
92. *Ibid.*, 1956-57, p. 219. Last year in the earliest deposits at Eran on the Bina.
93. *Ibid.*, 1954-55, p. 15.
94. *Ibid.*, 1958-59, p. 48.
95. *Ibid.*, 1957-58, p. 47. In the north-east in the basal layers of the famous site at Sohagaura, Dist Gorakhpur.
96. *Ibid.*, 1958-59, p. 45.
97. *Ibid.*, 1958-59, p. 12, pl. X, A. (The fabric is coarse).
98. *Ibid.*, 1956-57, p. 79.
99. *A.I.*, No. 10, and 11, Fig. 6.
100. *Ibid.*, Fig. 7, omitting No. 20, which is a rare type and in red ware and painted in black) and Fig. 8.
101. *Ibid.*, Fig. 9, 51.
102. *Ibid.*, Fig. 9, 49-50.
103. *Ibid.*, Fig. 9, 45-46.
104. *Ibid.*, Figs. 6-8.
105. *Ibid.*, Figs. 6, 4, 12, Fig. 7, 19.

of small spirals[106] on the outside. (*v*) Concentric circles[107] or semi-circles, (*b*) sigmas[108] or (*c*) svastikas[109] either on the outside or on the interior of the base. (*vi*) Rows of scalloped pattern, imitating a 'rising sun' bordering concentric circles[110], a very rare design. (*vii*) Rows of circular wavy lines,[111] (*viii*) Rows of chains bordering a circle.[112] (*Fig. 73*)

Besides the painted Grey Ware, three or four other pottery fabrics[113] were found in association with it.

All these are equally old, but not important at the moment.

Undoubtedly the Painted Grey Ware holds a significant position by being placed between the Harappan and the Northern Black Polished pottery,by its specialized distribution pattern within the Ganga Valley, its association with the traditional *Mahabharata* sites, such as Hastinapur, Tilpat, Ahichchhatra, and its likely affinity with similar pottery from Shahitump (both in fabric and designs, particularly the swastika) and farther afield in Sicily. Still, with all the potentialities it promises for unfolding an unknown facet of our culture, we know indeed little, about other aspects of the people who introduced this pottery, and nothing is done so far to fill up this vacuum.

Insignificant exposures of the Painted Grey Ware levels at Hastinapur,[114] Rupar and Alamgirpur suggest that the people lived in mud-covered reed houses, ate rice besides beef, pork and venison and knew copper and the horse. Towards the late phase of their life, iron was introduced. Surely this picture of the people who are likely to be a group of Aryans and possibly some of them the Mahabharata heroes is wholly inadequate. Without the "area" or "horizontal" excavation which will lay bare a fairly large sector of the Painted Grey Ware habitation this will remain vague and in a most tantalizing condition.

Southwards and westwards in North and South Rajputana, it appears that several groups of people or tribes lived, perhaps much earlier than the Painted Grey Ware people. Along the banks of the Sarasvati and Drishadvati which now disappear into the desert near Hanumangarh and are known as the Ghaggar in Southern Panjab—were a number of cultures of the Indus Valley type or slightly later. So far their existence is known by the sherds collected by STEIN and GHOSH in 1941[115] and 1950-53[116] respectively. So far 20 Grey Ware sites have been noticed in the Saraswati Valley and one in the Drishadvati in Bikaner. But unless further work is done, nothing more can be said about them.

106. *Ibid.*, Fig. 10, 66.
107. *Ibid.*, Fig. 6, 15; Fig. 9, 61.
108. *Ibid.*, Fig. 10, 70.
109. *Ibid.*, Fig, 6, 14; Fig. 10, 64.
110. *Ibid.*, Fig. 10, 67.
111. *Ibid.*, Fig. 10, 68.
112. *Ibid.*, Fig. 10, 65.
113. *Ibid.*, p. 44, Figs. 11-13.
114. *Ibid.*, p. 13.
115. STEIN, AUREL, " A Survey of Ancient Sites along the " lost " Saraswati River," *Geographical Journal*, No. 39, pp. 173-82.
116. A. GHOSH, "The Rajputana Desert—Its Archaeological Aspect," *Bulletin, National Institute of Sciences in India*, No. 1, pp. 36-42.

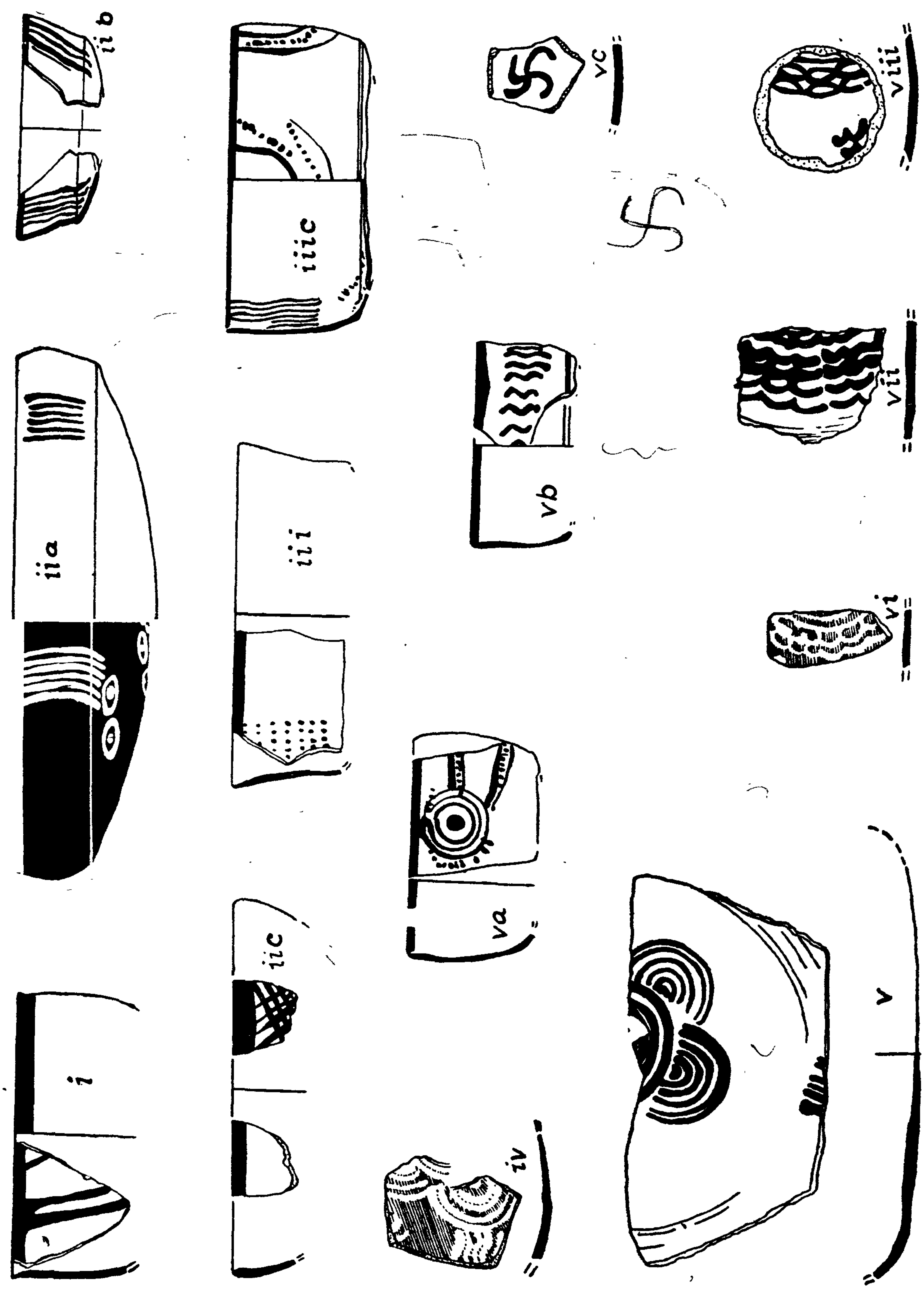


Fig. 73. Designs on Painted Grey Ware Pottery.

Ahar Culture

In the south-east Rajputana, in the valley of the Banas and the Chambal, Shri R.C. AGARWAL brought to light a culture which by its characteristic pottery is known as the "painted black-and-red or cream" or Ahar Culture after the type site Ahar, in the city of Udaipur.[117] Since then a large number of sites have been discovered, but the extent of the culture seems to be confined to south-eastern Rajputana[118] comprising the districts of Udaipur, Chitorgarh and Bhilwara with outliers in the adjoining district of Mandasor. But the ware or its variants had also reached Nagda, Navdatoli on the Narmada, Prakashe on the Tapi and Bahal on the Girna. This distribution pattern is in a sense provisional, because much of the pottery is not yet fully reported, and there are likely to be differences of opinion as to whether a particular sherd belongs to this group or not. What seems to be certain is that the centre of the Ahar Culture was south-east Rajputana.

However, the question from where Ahar or this region derived its peculiar pottery is difficult to answer, unless Ahar itself is more fully excavated, and some absolute date established from its earliest phase. The question is further complicated because a black-and-red ware is found throughout at Lothal (and also at Rojadi). This means that the ware was known to the Harappa Civilization in Saurashtra. It may be that the pottery types of the latter are different from those of the typical south-east Rajasthan and Central Indian group. However, the fact remains that the peculiar inverted firing was known and practised elsewhere, perhaps at an earlier period, which may be around 2500, B.C. Whence did the Harappans of Saurashtra get or borrow this technique?

In our present knowledge, vessels made in this technique first appear at Badari and Der Tasa in Egypt,[119] where they are called "black-topped". Formerly this would have been too distant a source, as our pottery was mainly early historical, but since the distance is halved by 2500 years, the Egyptian analogy is worth investigation.[119a]

Since the above was written (September 1960), the writer had an opportunity to conduct a larger excavation on behalf of the Deccan College and the University of Poona, jointly with the Department of Archaeology, Rajasthan Government and the University of Melbourne, Australia, during 1961-62. This work enables us to have a little more detailed picture of the Ahar Culture.

The earliest inhabitants settled on the ancient terrace overlooking the left bank of the river Ahar which rises a few miles upstream in the north-west of Udaipur.

Continuous occupation after repeated destruction and rebuilding for nearly 25,00 years has now made the site into a mound, which is nearly 50 ft. high, 16,00 ft. long and 5,00 ft. wide. Some 30 years ago, however, it stretched at least 2,00 ft. in either direction. The habitation debris which are about 45 ft.

117. *I.A.R.*, 1954-55, pp. 14-15, pl. XXV.

118. *Ibid.*, 1955-56, p. 14 ; 57-58, pp. 28, 44 and 56-57, p. 17.

119. CHILDE, V. GORDON, *New Light on the Most Ancient East*, (1952), p. 34.

119a. To this may be added the new evidence obtained by Shri B. B. LAL, from his excavations in Nubia. Though there is great distance of time and space, still the analogy between the megalithic types of South India and this early Nubian black-and-red ware is striking.

thick can be provisionally divided into two periods. Period I is protohistoric (Copper Age). It was unusually long compared with the historic. Total thickness of its remains is around 35 ft. This comprises at least 15 building levels and several earth layers. But on the basis of the presence or absence of characteristic pottery fabrics and forms it is divisible into three phases Ia, Ib, and Ic. Some four C-14 dates kindly supplied by the Tata Institute of Fundamental Research Bombay, range from 3700 $\pm$ 140 to 3525 $\pm$ 110. Thus we may date the phase between 1800 B.C.—1200 B.C. In Ia are present a few sherds of thin, buff ware and cream-or-white-slipped ware. These disappear in Ib, but the "stone-ware"-like pottery made with fine levigated clay, well-baked and consisting only of dishes-on-stand and dishes continues. In Ic, the black-and-red ware bowls develop a marked carination at the shoulder and are now painted by a delicate chevron design, whereas the "stone-ware" is absent. This phase is also marked by the occurrence of a few sherds of lustrous red ware of Rangpur type and dishes-on-stand and large globular vessels of a painted black-on-red ware.

Having a total thickness of about 10 ft., Period II is also subdivisible into three phases: IIa, IIb, IIc. Iron and NBP occur in IIa, whereas ring-wells and Rangmahal type pottery in IIb and IIc.

From the beginning the people lived in stone-and-mud houses, the foundation walls of which were built roughly with easily dressed local schist stone. These were in several courses, to judge from the surviving examples. Some of the mud-brick[120] and/or mud-walls seem to have been supported by or laid on bamboo-halves and screens, as shown by the burnt impressions of the latter, found in wall debris. To strengthen and beautify the walls, nodules of quartz which are most easily available as weathered rock were mixed with clay, a practice which is continued up to this day. The floors were made with thick sticky black clay mixed with yellowish silt. While re-building, the hollows or depressions in the floor are found occasionally to have been filled up with blocks of cemented gravel, quarried apparently from the river bed.

The exact plans of houses are not discernible, but they were fairly large. Of those excavated, so far, one has an overall size of 30 ft. x 15 ft. ; in another case, the wall is nearly 45 ft. long. There is no doubt that such large rooms were partitioned into smaller ones, with the help of thick walls of mud or mud-brick, which apparently seem to have been constructed without the support of wooden or bamboo posts embedded in the floor. For few post holes are found in the floor.

This feature looks rather surprising, but even now in the modern Ahar village, houses contain few wooden or bamboo pillars, for the roof made up of bamboo rafters rests directly on the end walls, which taper up and meet. On their junction rests a thick cross beam of undressed tree trunk. This serves as a spine against which lean bamboo rafters. These are covered by hand-made flat tiles. How the houses were roofed anciently we do not know. But barring the use of tiles, other constructional features should have been the same as mentioned above.

The Aharians went on building like this over and over again without any change, throughout their existence which seems to have lasted for at least a

120. *I.A.R.*, 1954-55, p. 15, pl. XXV.

thousand years, if not for two (c. 2,000 B.C.- 3,00 B.C.). In one trench, no less than thirteen building levels were encountered; in others which are on a lower level, five or six. Sometimes, the older stone walls were repaired or their levels raised; but very often, the old plan was given up, so that the newer construction lay across the floors of the earlier one. Such a continuous building activity raised the level of the settlement above the surrouding plain, making it a prominent feature of the hill-girt valley. To day after the latest occupation by an iron-using people about the 2nd-3rd century B.C.-A.D. the mound stands as mentioned earlier nearly 50 ft. above the surrounding plain.

The early Aharians manufactured a variety of pottery fabrics and forms for the manifold household uses (*Pls. XIV-XV*). In this the so-called painted black-and-red ware played only one of the roles; while its delicately painted dishes and bowls, some on stands, and small water vessels (lotas) served as "table" ware for eating and drinking, bright red-slipped vessels some exquisitely decorated on the neck and shoulder, with cut, incised and applique ornaments, provided various sizes of storage vessels. But this was not all. There were at least two or three parallel series in black, blotchy grey, tan and coarse red ware. Almost all these were ornamented in one way or another upto the shoulder or the belly, leaving the lower portion coarse. In fact this part of the vessels was intentionally "rusticated" or made coarse by the application of sand, because probably the vessels were kept buried in the ground or because they were meant for rough use as cooking. Often these vessels are thinner from belly downward, and so their top-heavy, beautifully decorted upper portion alone have survived, leaving us numerous fragments of the former.

Two or three other wares completed the pottery ensemble of the Aharians. The first is a stoneware-like fabric made of compact, extremely well levigated clay and well fired, so that the sherds give a metallic sound when struck. Lightly slipped in tan, orange, chocolate or similar hues, it has fine burnished, at times even polished surfaces. So far, only fragments of dishes or plates with slightly inturned rim and cut or grooved below the rim and plates with stepped outgoing rim and stems of dishes-on-stand have been found from the lower levels. It is possible that all these form part of a vessel such as dish-on-stand, or of a dish which rested on an exquisitely made stand. Whatever it is, this pottery is quite distinctive and might have had an exotic or foreign origin. Such certainly is true in the case of a thin buff ware and cream-slipped painted in crimson blackish red. Some 30 sherds of both these, probably belonging to two vessels occur, again in the lower levels. It was formerly believed that the white-slipped ware figures only in the top layer of the Chalcolithic, but this view has now to be given up. Secondly, the buff ware recalls similar ware from Amri in Sind and Nal in Baluchistan and farther afield in Iran, rather than that of Navdatoli (which might be an imitation). The Ahar buff ware is indeed an import.

Besides, unusually large number of saddle querns, with round or elongated hollows and correspondingly round and long plano-convex rubbers, no stone artifacts figure in the Ahar culture. The querns and rubbers, or pounders were no doubt meant for grinding grain; what this grain was, we have not yet determined, for no loose, charred grains have been found. But impressions of husks on pottery and from their study as well as the study of soil samples, we shall soon know about some of the chief items, including the animals, which consti-

tuted the food of these people. For they were also non-vegetarians, and relished venison (meat of deer). Cooking was done on hearths or *chulahs*. Two intact ones are thinly plastered with lime, with beautiful finger impressions. Secondly these are so large that along with large houses they definitely indicate that these ancient people had large families and cooked two or three dishes together in equally large vessels. In other house, no less than six *chulahs* are found in a row, which makes us wonder whether they served a large family or a group of families or a workshop.

However, the total absence of stone tools and weapons in the former as well as in the current excavation suggested that the inhabitants of ancient Ahar must have relied upon copper or its alloys. For Rajasthan has a number of copper mines and quarries, which were worked until very recently. And a large number exists within 20 miles radius of Ahar, at Dev Bari, Delwara, Kotri and other sites. This presumption was soon strengthened by the discovery of four flat, socketless copper axes and a copper sheet both laid in pots, copper bangles and finally by the discovery of copper slag in a specially made round pit, about 1½ ft. in diameter. Copper which is locally available was evidently smelted at Ahar from the very beginning of its setttlement and one may say formed the basis of its economy. Probably it was the magnet which drew the earliest colonisers at Ahar and other sites in the Banas Valley and made them live there for hundreds of years, until the beginning of Christian era,[120a] when an iron-using people from the north made this mode of life unprofitable. So a change in the way of life—houses, pottery, ornaments, tools and weapons—is noticeable only after 2,000 years.

Among ornaments besides a copper bangle and ring, occur large terracotta beads, or spindle whorls; some of these are decorated with varied incised ornamentation, such as chevrons, row of arcs, zigzag arches, etc., the most remarkable being what looks like a stylized stag. Such decorated beads are not known to figure in the Indus or any of the Chalcolithic cultures of India, but are found in the Chalcolithic and Early Bronze Age Cultures at Anau[120b] in Central Asia and Troy[120c] in Turkey. The analogy with the Trojan spindle whorls is very close, but what this signifies is difficult to say without further research.

Figs. 74—74C

These illustrate only a few of the characteristic pottery types from the site of Ahar, Udaipur, Rajasthan and Rajar Dhipi, near Burdwan in West Bengal.

74B, Pl. XV

1. A large storage jar having decorated shoulder, with low corrugation round the neck and oblique cut and incised criss-cross decoration on the shoulder. The belly and all

120*a*. This is according to the supposed nature of the finds. But a C-14 date from Layer 5 in Trench X at a depth of 6 ft. 6 in. comes to 3245 ± 110, that is *c*. 1200 B.C. This would indicate the end of the Copper Age habitation and a long hiatus between it and the Early Historic. This gap is however not demonstrable stratigraphically.

120*b*. *Explorations in Turkestan, Prehistoric Civilizations of Anau*, Ed. by Raphael PUMPELLY, Vol. I, p. 163. fig. 350.

120*c*. Carl W. BLEGEN and others, *Troy*, I, pt. 2 (plates) figs. 221-22, 366-67 ; Vol. II, pt. 2, figs. 54-58 ; and 151-33 ; Vol. III, pt. 2, figs. 306-308.

the portion below it is intentionally roughened. This is a characteristic feature of the Ahar pottery.

2. Neck and shoulder portion of a large storage jar in dull red ware, ornamented with ribbed, applique and broad serpentine decorations. The lower as in 1 was very probably unslipped and deliberately roughened or rusticated.
3. A fine vessel with bright red slip, ribs in low relief round the neck and deeply cut, teeth-like ornament round the shoulder and belly. Low, inward, tapering neck is also a characteristic feature of these vessels.
4. Bowl, black-and-red ware with paintings in white, hatched parallellograms alternating with a group of verticals.
5. Small *lota*-shaped vessel in black-and-red ware.

Fig. 74 and *Pl. XV, 3, 5.*

Four most prominent shapes in black-and-red bowls at Ahar are here illustrated. Forms 1 and 2 figure right from the early period, (Ia and Ib), while the forms 3 and 4 known as " bowls with pronounced carination and concave sides " characterize the late phase (Period Ic), before the beginning of the historic period (Period II) about the 2nd-3rd century B.C. Delicate chevron decoration on this concave surface is also a characteristic feature (*Fig. 75B*, 4).

Fig. 74A

This figure illustrates four other pottery types of Ahar Culture.

1. Dish-on-stand in painted black-on-red ware. The base is broad, as in many other earlier vessels of similar shape, but different in fabric; the connecting stump is hollow which is also a peculiarity of stands at Ahar. Period I C.
2. Bowl-on-stand, in burnished grey ware. The stand is disproportionately large, long and broad for the bowl. It is also hollow. This feature and shape recalls similar hollow based bowl-on-stand in grey ware from Hissar II B in Iran.[120c]
3. Large, basin-shaped vessel in blotchy tan ware, the inner part of the basin is black, while the exterior of the base is intentionally "rusticated." Phase Ia, from the floor of the earliest house in Trench Z.
4. Small *lota*-shaped in burnished grey ware. Details as in 3 above.

Fig. 74C

This figure illustrates a few distinctive pottery forms and fabrics from Rajar-Dhipi, in the Ajay Valley, Burdwan District, West Bengal and one pottery form from Ahar.

1. Large basin-shaped vessel in black-and-red ware. With this may be compared Fig. *74 C*, 3 from Ahar.
2. Large basin-shaped vessel, black-and-red ware, with inturned rim, which is also cut or indented at the edge.
5. Large basin-shaped vessel with a small cut spout.

120c. SCHMIDT, *Excavations at Tepe Hissar*, pl. xxiii, H. 2889 and pl. xxvi, H. 4161.

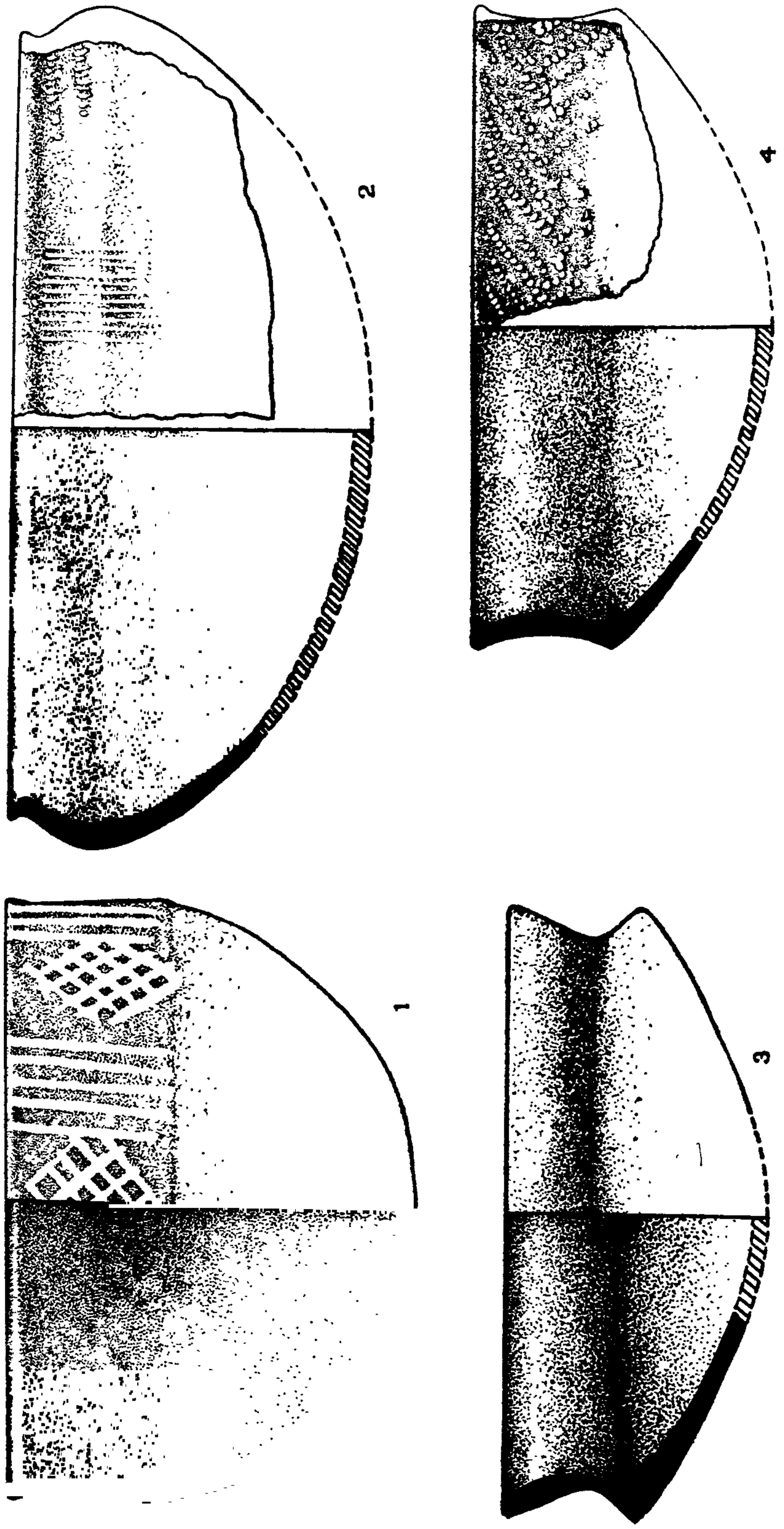


Fig. 74. Painted black-and-red Ware from Ahar.

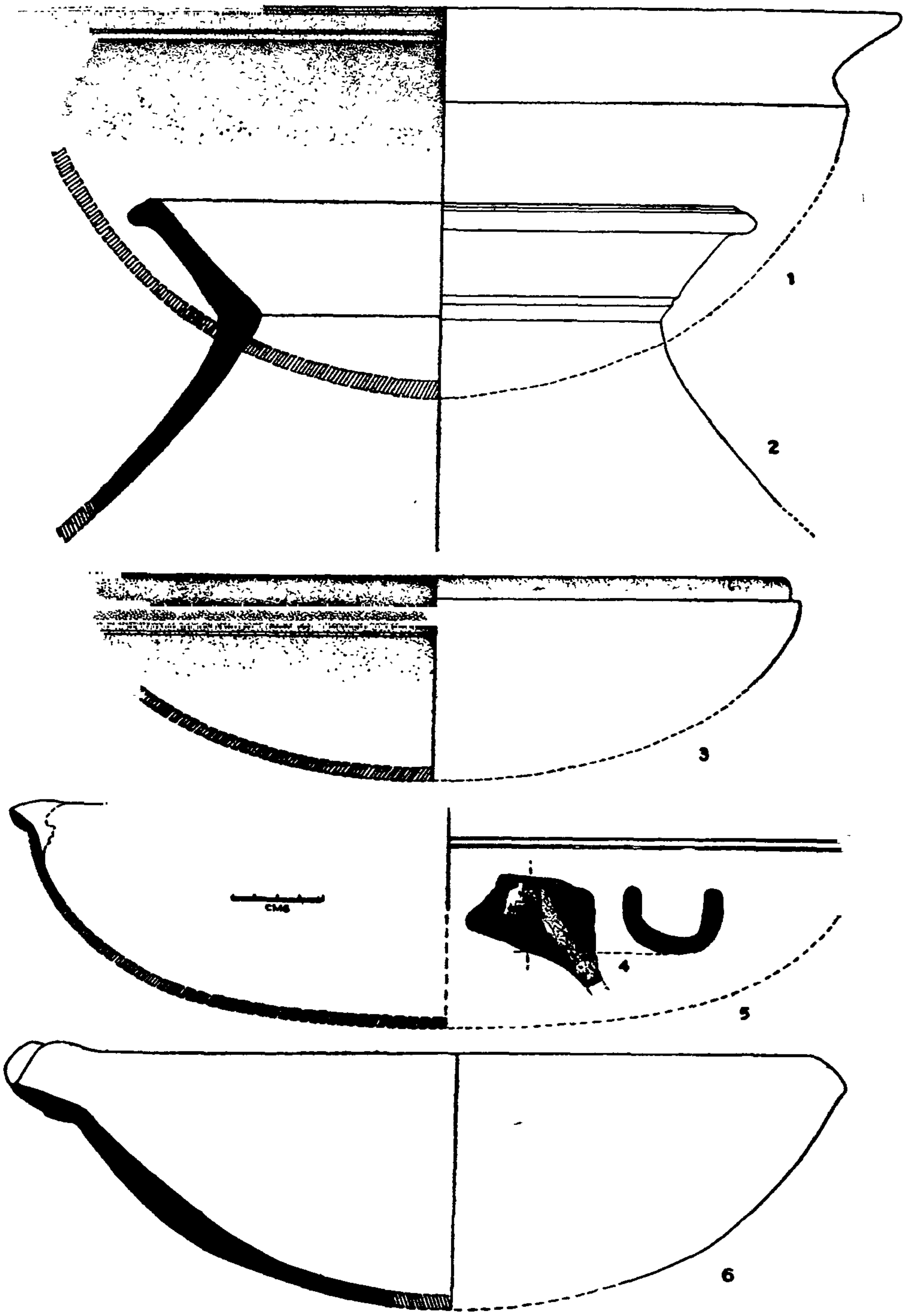


Fig. 74C. Pottery from Ahar and Rajar Dhipi, (p. 239) W. Bengal.

4. Cut spout in black-and-red ware.
6. Large, basin shaped vessel with a cut spout in burnished light red ware, from Ahar. Period II. This peculiar form may be a survival from the protohistoric. It is now reported from Sonpur in Bihar,[120d] and was found previously in Period I at Ahichchatra[120e] in Uttar Pradesh.

Gilund Culture (Fig. 75)

South-eastern Rajputana, however, was not a pure island of black-and-red ware Chalcolithic Culture. This is well illustrated by the rather extensive excavations near Gilund, about 45 miles north-east of Udaipur (as the crow flies).[121] Both as regards building methods or fashions, and pottery types and fabrics, other cultural influences—which may signify racial or tribal groups—were at work, either from the adjoining regions of Malwa or from within Rajputana itself.[122]

About a mile off the right bank of the Banas,[123] there are two large mounds, 45 ft. and 25 ft. high respectively, separated by a depression. While both the mounds were inhabited from the Chalcolithic period, the western mound seems to have been abandoned after this period, while the eastern mound continued to be lived upon during historical periods.

Four structural sub-periods (or phases) within the Chalcolithic have been noticed on the western mound. Of these, a large enigmatic structure about 100 × 80 ft., having four parallel north-south walls was joined at the southern end by an east-west wall. There were two more east-west walls parallel to the last. from which another group of three north-south walls emerged. These walls (13 ft. × 5 ft. × 4 in.) are made of mud-bricks, which are laid alternatively as headers and stretchers and cemented with mud. The space between the parallel walls was filled with sand, while some of the inner and outer walls have been plastered with mud mixed with a little of lime.

A mud-brick house with a clay-lined pit (oven?) was exposed in the second structural sub-period, and the last showed a kind of degeneration by the use of burnt brick-bats etc.

More interesting and of great significance is the occurrence of a kiln-burnt brick-wall laid over a stone-rubble foundation in another trench called GLD-3. It is not yet fully excavated but even its dimensions of 36 ft. by 1 ft. 10 inch. make it a formidable feature of the habitation. The wall was further plastered with a mixture of clay, sand and lime.

What this brick structure was is not known, as it is not fully uncovered. But to have bricks of the size of 14 in. × 6 in. × 5 in. in a Chalcolithic building outside the Indus Civilization is in itself a very interesting development in our knowledge of the contemporary cultures of the period. Some of the houses—

120d. *I.A.R.*, 1959-60, fig. 6, 17.

120e. *A.I.*, Vol. I (1946), fig. 1, 14.

121. *I.A.R.*, 1959-60, pp. 41-46, fig. 16, pls. XLI-XLVI.

122. This opinion was confirmed by a personal inspection of the site in March 1961. In fact it needs a horizontal excavation, as it is so vast and holds a crucial position in south-east Rajputana.

123. The river now flows at a distance, but anciently should be flowing much nearer.

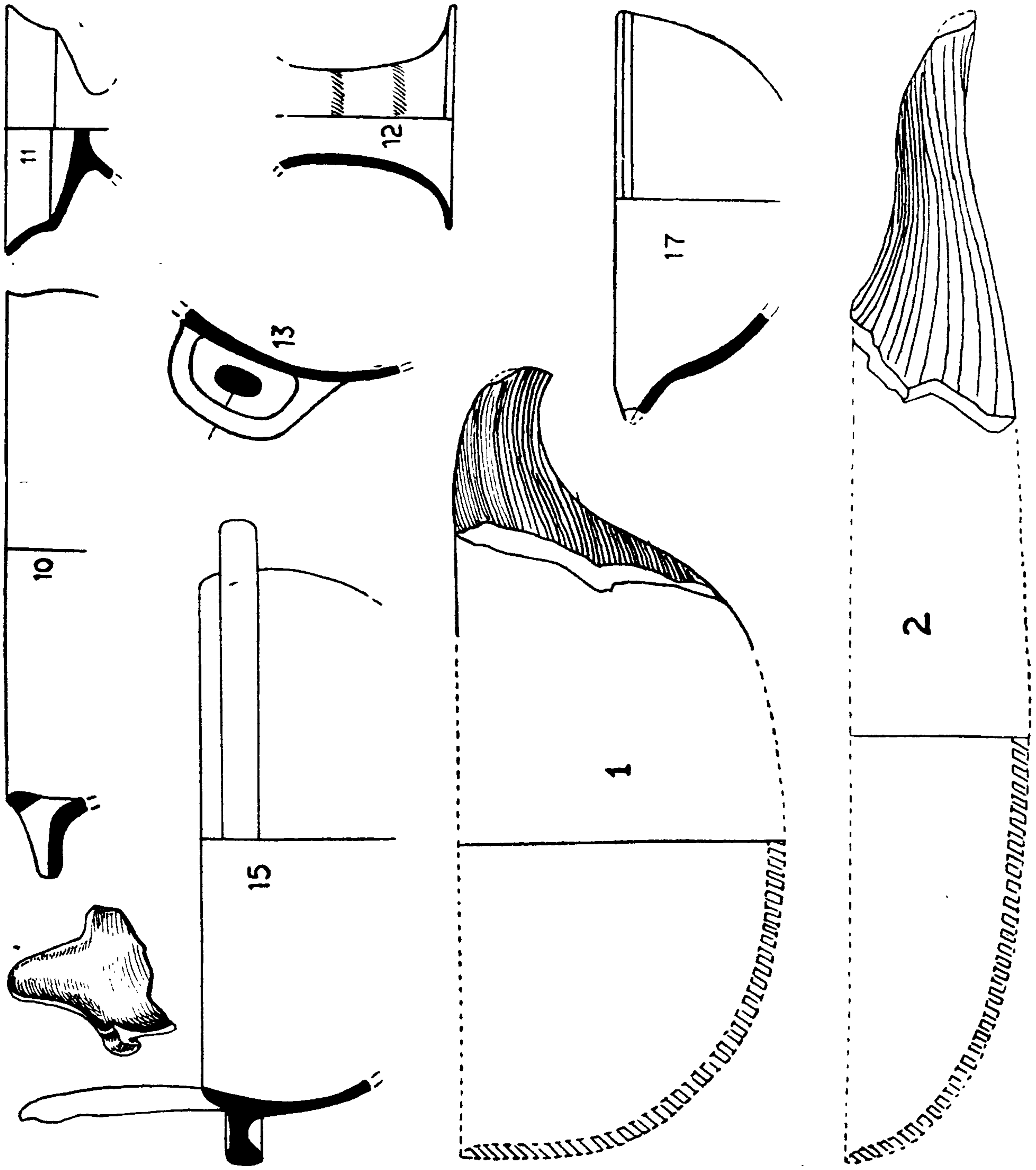


Fig. 75. Pottery types from Gilund (Rajasthan) and T. Narasipur (Mysore).

particularly those of mud or mud-brick—were roofed with a mixture of reddish clay or mud mixed with reeds and split bamboos (as it is done today in several villages).

The houses were provided with white-washed earthen ovens, and clay-lined pits, some of which were 9 ft. in length, 6 ft. in breadth, 2 ft. in depth, and lined with ½ in. thick plaster of white clay and sand mixed with a vegetable fire.

While Gilund has certain features common with those of Ahar—particularly mud-brick houses, built-in storage bins—it also considerably enlarges the picture of the Chalcolithic south-east Rajputana with its huge structures of mud, mud-brick and burnt-bricks. These no doubt imply several types of economic, political and civic factors. This is further corroborated by the ceramic evidence. As at Ahar, at Gilund we have a large variety in fabrics and types. Besides the principal painted black-and-red ware, were collected (1) plain, (2) painted black, (3) burnished grey, (4) red and a few specimens of (5) polychrome ware having black, bright red and white on a red background.

The black-on-cream and black-on-red were found in the upper levels and the rest were from the lower levels.

With regard to types in the painted black-and-red and simple black, the recurrent types were bowls and dishes, with designs in white either on the inside or the outside or both. Among other wares the dish-on-stand in the red and black-on-red, the high-necked jar and basin with cut-spout in the red ware, and the lipped (or legged?) basin and vase with strap-handle in the burnished grey ware deserve special notice. Of particular interest is the large cut-spout basin. Such vessels were hitherto rare in India, but a feature of West Asiatic pottery. Fragments of strap handles and cut-spouted bowls have been found previously at Navdatoli, with which Gilund seems to have some contact. In fact, the excavator dates Gilund between 1700 B.C. and 1300 B.C., because typical Navdatoli cream-slipped ware with designs like dancing figures and spotted animal are found in the topmost levels of Gilund, whereas at Navdatoli they figure in Period I and II. Though this may be true, it should not be forgotten that both Gilund and Navdatoli might have got these from a third source. For even at the latter the cream or white-slipped ware is comparatively small in quantity and disappears completely after Period II.

Other objects—saddle querns and rubbers, sling balls, beads of terracotta and semi-precious stones and steatite—are after the types known from other Chalcolithic sites and indicate the methods of grinding corn, methods of warfare and types of ornaments. However, among the terracotta figurines, bulls with prominent and long horns[124] and games-men with a variety of heads—one having that of a ram—are after the Indus or Harappa tradition, though considerably inferior in workmanship. Curiously very few blades, either of chert or of chalcedony, have been found either at Ahar or Gilund. This might suggest the real absence of the blade industries from these cultures, because copper was plentiful, being more easily available. For, had stone been used, traces should have been there. Beautiful fluted cores of an earlier (?) microlithic

124. *Ibid.*, pl. XLVA, 4, 5 and 1-3, respectively.

culture have been found at several sites on the hilly flanks of south-east Rajputana. So the material was there.

Before leaving Rajputana, it should be mentioned that not only Gilund, but a site at Khurdi, Parbatsar Tehsil, District Nagaur, now in the heart of the desert without any river in the vicinity, has yielded a copper hoard. This includes a flat copper celt, bar celt or square sectioned chisel, concavo-convex thin sharp-edged Indian *parasu* (axe)-like sheets and a complete, large, bowl with a channel spout. The last is identical in size with that more or less complete form from Navdatoli.

Sothi Culture

Further the sites of Sothi[125] and Nauhar in the Drisadvati valley have got coarse white-slipped and Malwa Ware, as a study of Shri GHOSH's collection showed. Thus Rajputana being a halfway house from north to south, seems to be a junction of several Chalcolithic Cultures. Its systematic exploration followed by large scale excavation of such sites as Ahar, Gilund and others to be discovered in future is sure to unravel the relationship and route of these and other new cultures.

Malwa

Adjoining Malwa seems to be a bee-hive of activity, all probably characterized by a pale brown or red pottery painted with black designs, and hence called the painted black-on-red ware or the Malwa ware. An invaraible concomitant of this pottery was a lithic industry, in which parallel-sided blades predominated. Hence it is called the "Short" Blade Industry of the Chalcolithic Period.

To date two or three sites of this culture are excavated. Two or three are in the Chambal Valley, of which Nagda was excavated in 1956-57, whereas Maheshwar and Navdatoli on the Narmada were excavated in 1952-53 and 1957-59. The report of the work at Nagda is not yet published, but that of the first season's work on the latter site[126] is available. Moreover, Navdatoli was extensively dug and it gives a fairly good picture of the Chalcolithic Malwa. This is therefore described in detail here.

Navdatoli Culture (TYPICAL C. INDIAN CHALCOLITHIC)

Presumably all these settlements —in Sind, the Panjab, Rajputana, Uttar Pradesh, Bihar, Saurashtra, Central India, Khandesh, North and South Maharashtra and even in the granitic regions of Andhra-Karnatak—were clusters of mud huts, though the Gilund evidence indicates the existence of baked-brick houses as well, whereas at Nagda the houses were built of mud-bricks. But barring Rajputana and the Panjab, where the settlements seem to rest on sandy alluvium, elsewhere they are on a black soil. This may imply a clearance of

125. WHEELER (*Early India and Pakistan*, p. 124), thought that the term 'Sothi culture' used by Ghosh was a little ambitious. Our study shows that the ware is distinctive and a variant, perhaps degraded, of the Malwa ware. Further study even indicates that some forms and designs might be pre- or early Harappan.

126. SANKALIA, H. D., SUBBARAO, B., and DEO, S. B., *Excavations at Maheshwar* and *Navdatoli* (Poona and Baroda 1958).

the jungle, the black soil itself being a weathering *in situ* of the brownish alluvium, owing to thick vegetation. This is clearly demonstrated at Navdatoli and Nevasa, the two sites which have so far been horizontally excavated and of which the writer has first-hand knowledge. Navdatoli is situated opposite Maheshwar on the Narmada, about 60 miles south of Indore. Both these sites stand on an old crossing of the river, which itself is a great commercial artery dividing India into two: Northern and Southern.

This black soil at Navdatoli, a small hamlet now occupied by boatmen (*navdas*)[127] covers a fairly large area, about 2 furlongs by 2 furlongs, and caps the top of four mounds which some 4000 years ago probably formed a single unit, which was later cut up by erosion. This single mound represented the top-most terrace of the Narmada ; the river itself presumably was flowing at the foot of its northern extremity, though now flows at a distance of about three furlongs to the north.

The present village of the *navdas* is situated on a still younger terrace.

Excavations on all the four mounds indicate that the entire prehistoric mound was occupied, but that some of its parts might have been occupied later than others. For instance, it was revealed last season (1958-59) that the north-eastern extremity of Mound IV was not inhabited before the end of Period II within the Chalcolithic. (*Pl. XVI, Fig. 77a*)

Houses (*Pl. XVII, Fig. 68*)

From the very beginning the inhabitants built round and square or rectangular huts. These houses were framed by thick wooden posts. Around these were put bamboo screens, which were then plastered with clay from outside and inside. The floor was also made of clay mixed with cowdung. Both were then given a thin coating of lime, so that the house when first built must have looked spick and span. The size of the largest rectangular room was 20 feet by 40 feet. But sometimes, a circular hut was only three to four feet in diameter, the largest being of 8 feet diameter. So it is doubtful, if it (the small one) was meant for habitation. Such small huts might have been used for storing grain, hay, etc. as the writer recently saw in Kurnool, Andhra State. But normally in Period II, the size of a room was 10 ft. × 8 ft. How many persons lived in a room or a house can only be guessed. But possibly not more than four in a room of 8 feet × 10 feet. Secondly, the settlement was so often rebuilt as evidenced by house floors that it is difficult to distinguish the house plans by mere occurrences of postholes. But judging from the modern village of Navdatoli, one may guess that the prehistoric village might have had about 50 to 75 huts, supporting a population of 200 persons.

In one house was found a well-made rectangular pit (4 ft. × 4 ins.) in the midst of it. Its sides are slightly bevelled ; all round there are postholes ; on either side at some distance, is a pot-rest made into the ground and possibly the remains of a single-mouthed hearth. Inside the pit were found two logs of wood, placed almost at right angles and the remains of two unique pots. These have a high corrugated neck with everted rim, a ribbed ovalish body with

127. This does not imply that the old village was of fishermen or boatmen as Wheeler (*Early India and Pakistan*, p. 142) says.

one or two incised bands, filled in with lime and a high hollow base (which looks similar to the mouth, so that until we could reconstruct the pots from this pit we were not certain which was the mouth and which the base). (*Pl. XVIII, Fig. 79 a-b*)

These houses were built very close to each other. But between a row of 4 or 5 houses, it appears there was an open space, like a *Chowk* (square).

Pottery (*Pl. XVIII-XXI*)

These houses were furnished, as is to be expected at this time and as we find in a farmer's house even today, with small and large earthen pots for storing, cooking and drinking. The large storage jars were strong and sturdy but generally decorated with an engraving or applique work along the neck. But what surprises us and delights our eye is their " table service," or dinner set. It is this which distinguishes these Early Navdatolians from the modern primitives like Santals and other tribes in Chota Nagpur, for instance. The Navdatolians had a large number of pottery vessels which according to their fabrics, shapes and designs fall into four distinctive groups, each having certain shapes and designs associated with a particular period (*Pl. XVI, Fig. 77b*). The most common is a pale red, slipped fabric with paintings in black over it. Since this occurs throughout Malwa (an old geographical name for parts of Central India), it is called the " Malwa Ware." This occurs as a major pottery fabric right from the first occupation and runs through the entire Chalcolithic habitation. However, in the earliest period only certain shapes and designs figure, both becoming more varied later (*Pl. XXII-XIII*).

Then there is a sprinkling of black-and-red ware, with paintings in white, comprising generally bowls (with gracefully inturned sides) and cups. This fabric is confined only to Period I and seems definitely to be an import from the adjoining region of Rajputana, where at Ahar it occurs in profusion.

The third important fabric is the white-slipped one. (*Pl. XV*). It is associated with the first two periods only, but died out later. It has several gradations in slip and texture, but the finest is smooth, lustrous and slightly greenish-white.

Though it copies some of the shapes of the Malwa Ware, its own distinctive shapes are a shallow dish with broad, flat rim and stand, and a high concave-walled cup with bulging bottom. An almost complete bowl of the latter in fine white slip recalls a similar vessel from the earliest period at Sialk, in Iran (GHIRSHMAN, " *Fouilles de Sialk*," Vol. I, Frontispiece, 4). A band of running antelopes and dancing human figures seem to be characteristic designs in this fabric. (*Pl. XXII*)

In Period III occurs, for the first time, a new fabric called " Jorwe " after the " type site " in the Deccan. This has a well-baked core with a metallic ring and a matt red surface. Comparatively limited numbers of shapes and designs figure in this ware. It is also at this time that the most distinctive form of a vessel occurs. This is the teapot-like bowl. (*Pl. XX*) It is in Malwa fabric. During 1958-59 we were lucky in getting a complete bowl, which leaves no doubt about its shape and function. It seems to have been a vessel with which ablutions were

performed. Since it is without a handle, it has got to be held in the palms of both the hands, and the contents (liquid) poured slowly, as in a sacrifice or some such ritual. In order to control the flow of the liquid, a hole was sometimes made at the junction of the spout and the body of the vessel. A similar contrivance may be noticed in the channel-shaped bowls from Western Asia. A vessel identical in size and shape but in copper or bronze was found at Parbatsar Tehsil, Dist. Nagaur in Jodhpur some years ago, and it is exhibited in the museum at Jodhpur. (*Pl. XXVI, Fig. 89a.*)

Food

Besides this important change in pottery, there was another very significant change in the life of the people. For the first couple of hundred years or so, the inhabitants ate principally among the cereal grains, two types of wheat *Triticum vulgare compactum* and *Triticum* sp. The former which is small with blunt ends was extremely common, while the latter is larger and has pointed ends. The inhabitants also consumed from the beginning five kinds of legumes viz. (i) *Masur* or Lentil (*Lens culinaris* Medikus), (ii) *Urd* or Black Gram (*Phaseolus mungo* L.), (iii) *Mung* or Green Gram (*Phaseolus radiatus* L.), (iv) *Vatana* or *Mutter* or Green Peas (*Lathyrus sativus* L.), and (v) *Lathyrus* sp. besides four other leguminous weeds, the identification of which is not certain. The food was probably cooked with linseed (*Linum usitatissinum*) oil, the grains of which are found from the earliest phase.

However, it is in Phase II and onwards that rice enters the dietary of the inhabitants though throughout (from the quantity and distribution) the life of the occupation, it seems to be scarce and in short supply.[128]

These are the grains which are grown and eaten in the Nimad District today. Our discovery, the first of its kind in India, shows that the food habits of a section of the people of Madhya Pradesh are at least 3,000 years old. Though wheat was known before from Mohenjodaro, these are the earliest examples of rice,[129] two kinds of grain, *masur,* (lentil), *kulathi* and beans, and oil seeds like linseed. The distribution and antiquity of wheat, lentil and linseed suggests Western Asiatic contacts, whereas rice is believed by most authorities as indigenous to India. Thus two cultural and ethnic (?) strains seem to have met at Navdatoli. And though we do not know how these grains were cultivated, for no remains of plough have been found, a number of heavy stone rings, which have been discovered, might have been used as weights for digging sticks, as some primitive people still do in Orissa. Still it is obvious that a people who ate so many types of grains, and had such a variety of pots and pans, indicating varied needs and uses, were not so primitive as some tribes today.

The stocks of the grains were probably cut with sickles set with stone teeth, as thousands of such stone tools have been found. The grain might not have been ground into flour, but merely crushed[130] either dry or wet in deep, basin-shaped stone *patas,* called saddle querns in English, with the help of a

128. This is a revised account based on the final report by Dr. VISHNU-MITTRE of the Birbal Sahni Institute of Palaeobotany, Lucknow. It is published in *Technical Reports on Archaeological Remains,* Poona, 1961, pp. 13-52.

129. Rice impression is found Lothal A. See GHOSH, S. S., *Indian Forester,* 1961, p. 295.

130. I am glad to note that BRAIDWOOD, *op. cit.,* p. 45, also recognizes this fact and says that the querns might have been used for cracking of grains for porridge.

pounder or rubber. The resultant bread will be unleavened, as it is even today done in several parts of India. A number of these saddle querns were found, as they were left by their users, right on the kitchen floor, near *chulhas* or hearths. (*Pl. XXIV, C*) These again were quite large, made with clay and thinly plastered with lime. It is however not to be presumed that the inhabitants were strictly vegetarians. In the debris of their houses have been found remains of cattle, pig, sheep-goat, and deer. Except for the last, all must have been domesticated and eaten. But since the grains were varied and plentiful they relied less on animal food, and hence their remains are comparatively few in number as compared to those from Nevasa.

Farmers

Economically, thus, the early inhabitants of Navdatoli were fairly well off. They were essentially farmers or peasants, though a section might be living by hunting and fishing. They did not yet know iron; copper they used, but sparingly, in the shape of simple, handle-less axes, (*Pl. XXV*) fish hooks, pins and rings. In a later phase possibly they used daggers or swords with a midrib, as suggested by a fragment found in 1958-59. So for their daily needs of cutting vegetables, scraping leather and piercing stone, they had to rely upon stone tools; their blades[131] are so small that we call them "microliths." (*Fig. 103-04*) These were hafted in bone and wooden handles, as we nowadays fix an iron blade into a pen-knife. Among ornaments, we have thousands of beads of sand coated with a glaze and called "faience," or chalk and a few of semi-precious stone such as agate, and carnelian. These must have been strung into necklaces. Bangles and rings were also worn. These were of clay and copper.

Date

The earliest farmers in Madhya Pradesh lived, as we know from Carbon-14 dates, kindly supplied by the Pennsylvania University, about 2000 B.C. and continued to live on with three major destructions by fire (*Pl. XVI*) at least up to 700 B.C., when an iron-using people from Ujjain and possibly further North wiped out their existence and laid the foundation of a new economy in which iron, minted money, houses of bricks and altogether a new pottery played a dominant part.

The question who the first dwellers were, whose remains are found all over Malwa, is not yet resolved. Probably, they were a people from Iran, as their pottery shows. This is a very important and interesting clue. In that case, they might be a branch of the Aryans. This trail is to be followed up by further detective work across India and Pakistan up to Eastern Iran.

Not only Navdatoli gives some idea of the life in Southern Malwa, but its series of no less than seven C-14 dates (of which four are here given) ranging from 1791 $\pm$ 62, 3503 $\pm$ 128, 3449 $\pm$ 127 and 3294 $\pm$ 125 (all before A.D. 1962) definitely indicate the age and the time span of the culture. These dates are not only consistent among themselves, but agree fairly well with the C-14 dates for the corresponding periods for Chandoli, Nevasa and Ahar. Further with

131. This is indeed a blade industry, as SUBBARAO so well demonstrated, having had its origin in Western Asia, about 8,000 B.C.

C-14 dates now available for Lothal, Kalibangan and Kot Diji, it will help in understanding the movement of cultures in the whole of Western India.

Eran and Tripuri

Two other sites—Eran on the Bina and Tewar (ancient Tripuri) on the Banganga, a branch of the Narbada—should be mentioned. Situated in the Sagar and Jabalpur Districts of Madhya Pradesh, they further extend the range of the Malwa Culture, though the pottery shows some variation. Not much can be said about Tripuri, because only a few (6) painted sherds were excavated, whereas the lithic tools seem to be true microliths. And it is to be seen if further excavations show their contemporaneity with painted pottery or precedence. If the latter, it would once again prove the great antiquity of microliths in this region. Eran, however, is interesting; for here a true lithic blade industry is present. Besides the black-and-red and black-on-red ware, a fabric like the Painted Grey Ware also occurs. On the black-and-red ware there is also painting in white over the black surface. The excavators suggest two sub-phases of this period on the basis of a fire pit and a latter floor containing traces of burning. The two or more sub-phases are also indicated by the Carbon-14 dates kindly supplied by the University of Pennsylvania. The oldest goes back to 1949 ± 68 (B.C.); another is 1373 ± 65 (B.C.); and the latest is 789 ± 62. (B.C.) Thus this site gives us a time-range of over 15,00 years from about 2,000 B.C. to 700 B.C. and therefore the suggestion made above that an Iron-using people seem to have destroyed these Chalcolithic cultures is being proved at other sites as well, besides Navdatoli.

Chalcolithic Cultures of the Deccan

Now pottery and blades of the Navdatoli type have been unearthed at Prakash[132] in the Purna—Tapi Valley and further south at Bahal[133] in the Girna Valley, whereas surface explorations have revealed scores of sites in East and West Khandesh. This leaves little doubt that contemporaneously with Malwa, this region was inhabited. And now the question is " Are these cultures of the Deccan in any way earlier than those of Malwa? Has the culture movement been north-south or south-north or was it two way *all the time*? "

Till now we do not know the main focus of the Malwa Chalcolithic Culture. It would, however, appear that it had reached its fullest expression as far south as the Narmada, but its outliers had crossed the Tapi-Girna Valleys and reached as far[134] as the Pravara-Godavari, where it met another Chalcolithic Culture which had spread all over the Deccan and Mysore plateaux. Again we do not know the source of this culture, but it seems to have its roots in the purely Neolithic Cultures of South-East India.

If the evidence from Daimabad near Belapur, Ahmadnagar District is any guide, it appears that the first wave of Central Indian Culture which reached the Narmada in about 1500-1700 B.C. had also arrived in the Deccan and laid itself upon the earlier Deccan Culture.

132. *I.A.R.*, 1954-55, p. 13.

133. *I.A.R.*, 1956-57, p. 17.

134. Our very recent (March 1961) excavations at Chandoli, some 40 miles north of Poona, show that its elements like a dagger or a spear having an antennae and mid-rib had gone far south.

However, the indigenous[135] culture survived and seems to have contained the further expansion of these northern influences, and later became the main force in the Deccan. It is in this way that we can explain the differences in pottery fabrics and designs between Nevasa and Daimabad,[136] which are not more than 15 miles distant from each other, and lie on the Pravara.

Daimabad

The story seems to begin at Daimabad, which has a most promising 20-ft. mound overlooking the left bank of the Pravara. The Chalcolithic deposits are naturally thick and divisible into three sub-periods. In Period I is discernible a meeting of the Brahmagiri I and Navdatoli I cultures, if the observations regarding the pink-slip painted pot are correct. The latter recalls similar slipped pottery from Prakash and Navdatoli. Other pottery is mainly hand-made, decorated with incised and applique decorations. Lithic blades, terracotta and other beads and an extended adult skeleton buried right in the house make up the remaining features of this phase or period. Period II is marked by increase in black-on-red pottery of Malwa type (one having a channel-spout) and designs, as well as in stone blade tools, terracottas of a dog and a bull and a burial in a specially dug pit. In Period III Jorwe-Nevasa becomes supreme. It is also noted for the occurrence of two terracotta human figures, a stone mace-head or ring-stone and remains of houses—circular or rectangular in plan. The floors of the houses were rammed with clay mixed with husk and plastered with lime. Burial in houses continued, but remarkable is the position of a skeleton surrounded by 14 post-holes indicating a canopy and " lying-in-state before a burial."

Nevasa

Unfortunately this very interesting account still remains unpublished, and a promising site not further excavated. We are therefore forced to turn to the adjoining site at Nevasa, which, if not the key site, happens to be the only site in the Pravara Valley which is extensively excavated and partly reported upon.[137]

A large mound called Ladmod, nearly 900 ft. N-S and 400 ft. E-W, overlooks the Pravara river. Originally it might have been one whole, if the river really went round it, as the local people believe it. But now it is cut into two by the river, probably the major part remaining on the southern side. Of its imposing height more than half is made up by river silt, and only about 7 ft. is represented by the Chalcolithic deposit. This is so, because it represents only one cultural phase, which is called the " Jorwe-Nevasa " or Period III of Daimabad.

Four seasons of excavations and two C-14 dates independently arrived at by the Pennsylvania University and the Tata Institute of Fundamental Research have given some insight into the life of the people, particularly their range of pottery, tools and weapons, ornaments, the material for making clothes, *but*

135. However for an alternative view see below under Piklihal.

136. *I.A.R.*, 1958-59, p. 15.

137. Sankalia, H. D. and others, *From History to Prehistory at Nevasa* (Poona, 1960) and *I.A.R.*, 1959-60, p. 25 and 1960-61, p. 19.

not the type of clothes, and above all about the burial practices and their age. They definitely lived around 1100 B.C. the dates being 3220 ± 115 and 3106 ± 122 B.P. Our knowledge about the earliest Nevasa houses still remains vague, because unlike Navdatoli no clear house plans could be discerned.

Houses

Whether it be Malwa, Khandesh, Maharashtra or Mysore-Karnatak, the earliest remains of the habitation are found on a black soil. This today forms the surface (virgin) soil in many parts of the regions mentioned above. It is believed to be the weathering *in situ* of the underlying yellowish silt deposited by the river when it aggraded in Middle Pleistocene times. The weathering was caused by thick vegetation as a result of a damper climatic phase. Thus when the Chalcolithic people entered the river valleys, there must have been thick forests. Clearings overlooking the river, or not far from the river were effected with their stone and copper tools. Though none of these early settlements is fully excavated, it would appear that these elevated black-topped terraces were not very extensive, though fairly large for the times. At a time, each settlement might accommodate 50 to 100 closely set houses (huts). Each hut would be normally about 10 ft. by , though at Navdatoli we had huts smaller or larger than this. These huts were square, rectangular or round. They were constructed with round undressed wooden posts, about 3 inch in diameter (at Nevasa, Daimabad). The walls were of mud, whereas the roofs were probably flat or slightly sloping, and made of interwoven bamboo matting, dry leaves etc. and covered with mud. The floors were made either with a mixture of sand, gravel and clay, or burnt debris (of a previous habitation) and often plastered with lime which was sometimes carried up to the wall.

Furniture

These houses were largely furnished with large and small storage jars, other vessels of daily and special use, a hearth, and a boat-shaped saddle quern for pounding grains etc. No intact hearth has yet been reported from the Deccan[138] or Khandesh, but in Malwa and Southern Rajputana these were either like a large hollow cylinder open at one side, or three-mouthed. The latter might be of a larger house, or a house where two or three things were cooked simultaneously.

Pottery (Figs. 92-97 and Frontis-piece)

The pottery is mainly of two kinds. Partly made on a wheel or a turn-table and burnished a pale grey ware,[139]. The chief shapes being a few bowls, small lotas, globular vessels with high neck and urns of various sizes (*Figs. 92-95*). The other kind is wheel made and mostly painted black on a matt red surface. In it the dish (*thalis*) are conspicuous by their absence. Of the most common occurrence—in varied sizes, from about 2 in. to 10 in. and more in height—are bowls (*vatis*) and vessels (*lotas* or *tambya*) for storing and pouring liquids, having sharp angular walls and necks and long tubular spouts. The matt red surfaces of these are painted in black with most monotonous geometric designs consisting of hatched triangles, squares or rectangles, oblique dashes etc. (*Fig. 92*). But

138. This year (1960-61) a number of small circular or square burnt mud-wall enclosures supported by pebbles were found at Nevasa.

139. This is comparable both in fabric and form with that of Piklihal, see below.

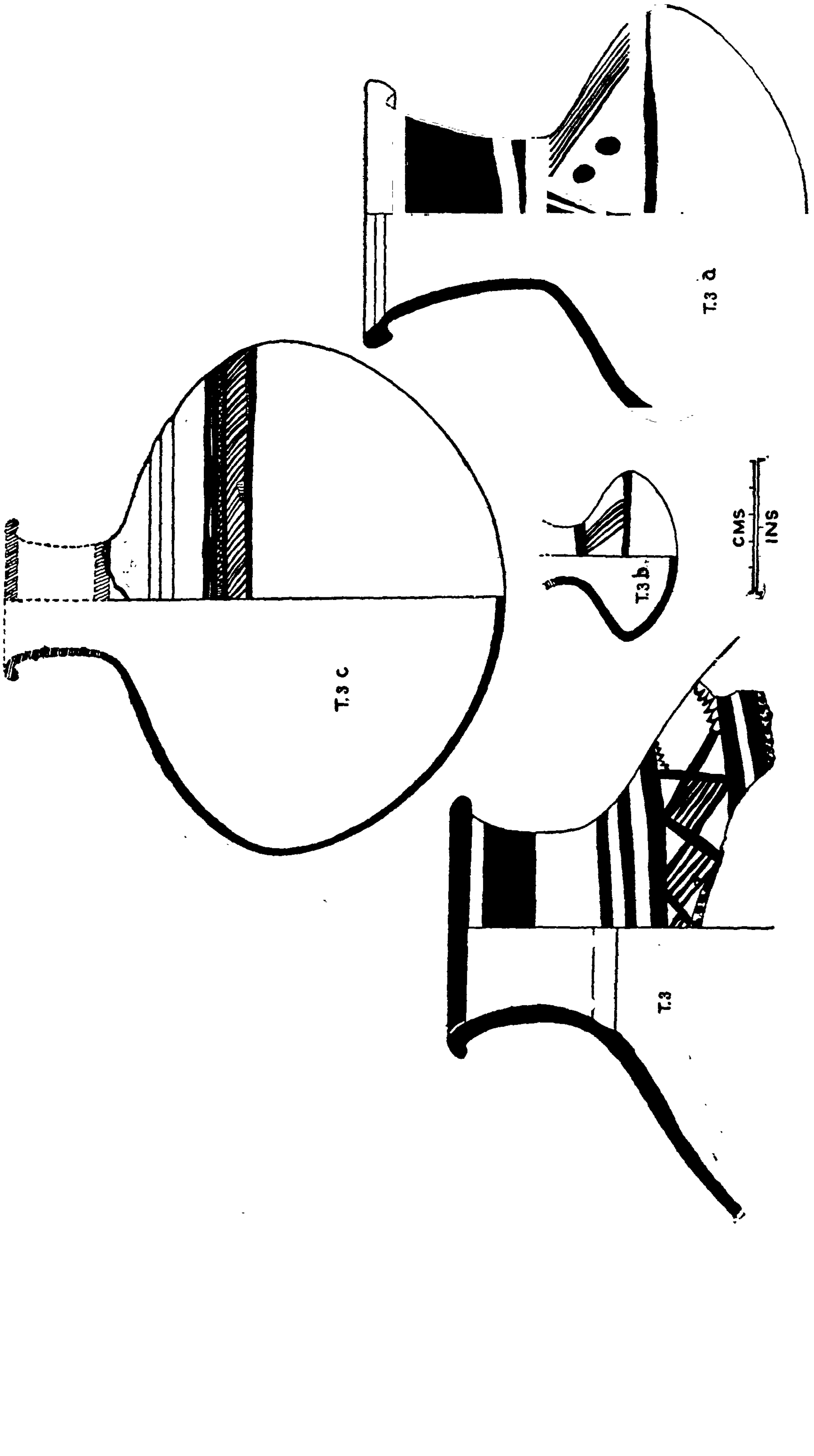


Fig. 92. Globular high-necked vessels from Nevasa.

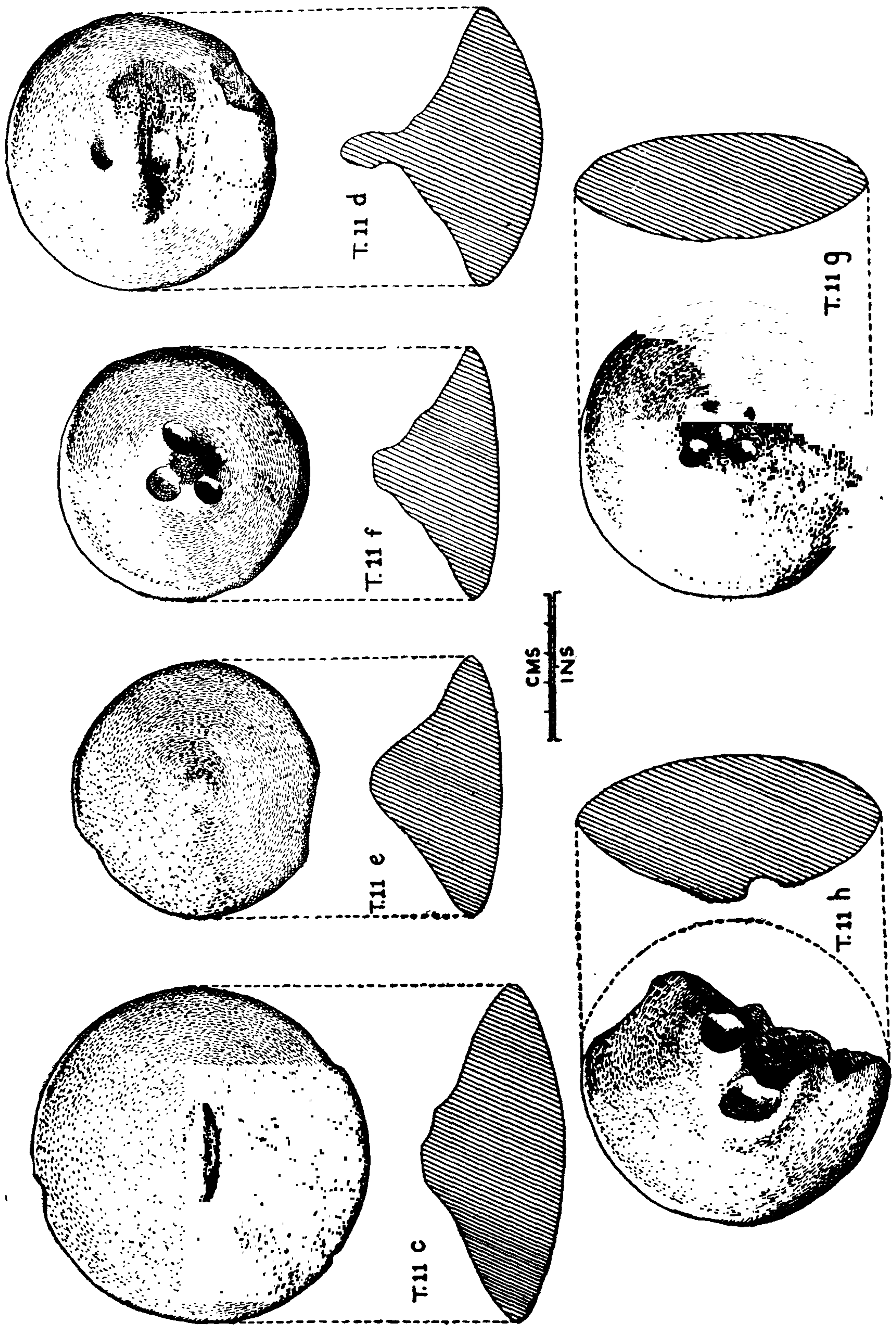


Fig. 93. Lids, Nevasa.

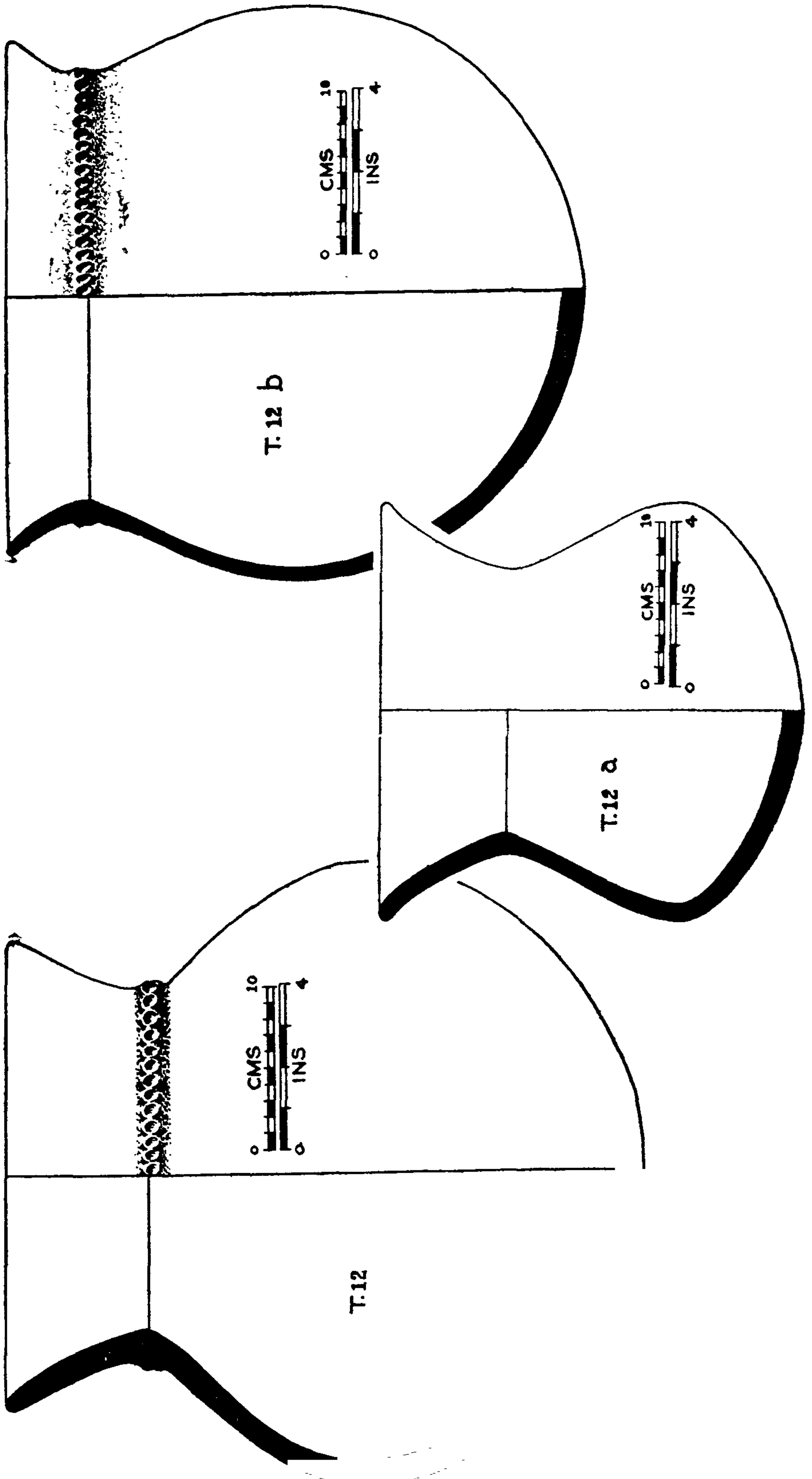


Fig. 94. Burial urns from Nevasa.

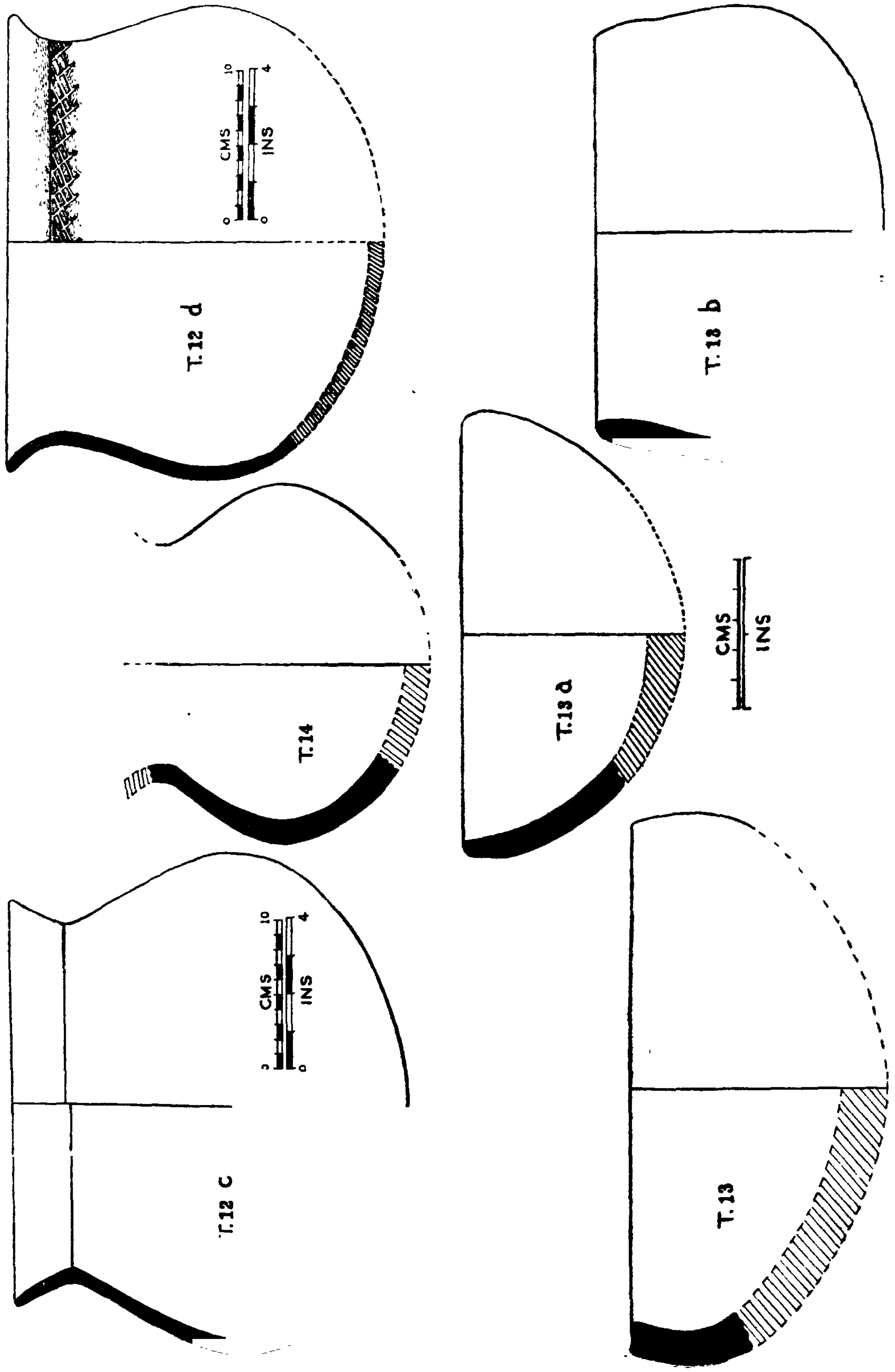


Fig. 95. Coarse Grey Ware from Nevasa.

this monotony is relieved at Nevasa by two unique specimens of realistic delineation of a deer and a dog or dog-like animal[139a] for the like of which one has to recall the Upper Palaeolithic cave art of Western Europe[139b]. Equally striking are the tigers and other animals with elongated and hatched bodies on a white-slipped vessel from Daimabad. (*Pl. XXX*). Such stylization again reminds us of similar motif on Sialk pottery. The largest storage jar was about 4 ft. in height and 3 ft. in girth, and decorated with finger tip decoration. (*Pl. XXVIII, C* and *Fig. 97*). Though no grains were found, the dough plates (*Fig. 96*) are identical in shape and fabric with those of Navdatoli.

No other remains of household goods or furniture like cots, wooden stools, (if there were any ?) have come to light, probably because these were invariably of wood and have perished.

Cotton, Silk and Flax

Nor can we form any idea of the dress. But recent evidence from Nevasa and also from Chandoli suggests that spinning of cotton and even (wild) silk and true flax was known. Presumably then garments of all these material must have been made.[139c]

Ornaments

Among ornaments by far the commonest are beads of semi-precious stones such as agate, amazonite, amethyst, carnelian, chalcedony, crystal, coral, glass, shell, steatite, chalk or faience, terracotta and less frequently of copper and rarely of gold (*See Fig. 101A*). All these were certainly strung into necklaces of which an almost complete example, that of copper beads, round the neck of a dead child was found at Nevasa in 1960. Three biconical copper beads found earlier in 1956 remain unrivalled. Silver seems to be completely unknown. Bangles were of the simplest type, and generally of copper, burnt clay and bone or ivory. Rings were worn on the fingers of the hand.

Tools and Weapons (Pl. XXIX and Fig. 102-7)

Until this year (1960-61) no intact examples of weapons had been found. It was therefore presumed that among the large number of products of the chalcedony blade industry, those which are called 'points' with or without tang, were probably used as arrowheads. Whether there were any of copper is impossible to say in the absence of any evidence. So also the flat copper axes were certainly hafted and used as weapons of offence. (In India, a *parasu* has long since been regarded as such a weapon). Round balls of various sizes (3 inch to inch) of stone—quartz and quartzite—might have served as sling stones. These few things—arrows, axe, sling balls—perhaps give a very inadequate idea of the armoury of the Chalcolithic people. The total absence of the sword and the dagger is perhaps due to the real non-existence of such advanced weapons, or may be explained by lack of large excavations. At Navdatoli, thus, a fragment of a dagger or a sword with a raised mid-rib was found in 1958-59 from the

139a. See SANKALIA, H. D., *Indian Archaeology Today*, Frontispiece.

139b. See SANKALIA, H. D. ,in *Dr. S. K. Belvalkar Felicitation Volume*, p. 243.

139c. The threads of all these were found in a copper bead necklace and were identified by DR. A. N. GULATI, see *Technical Reports on Archaeological Remains*, (Poona, 1961), p. 55 and *BDCRI.*, 1962-63, p.

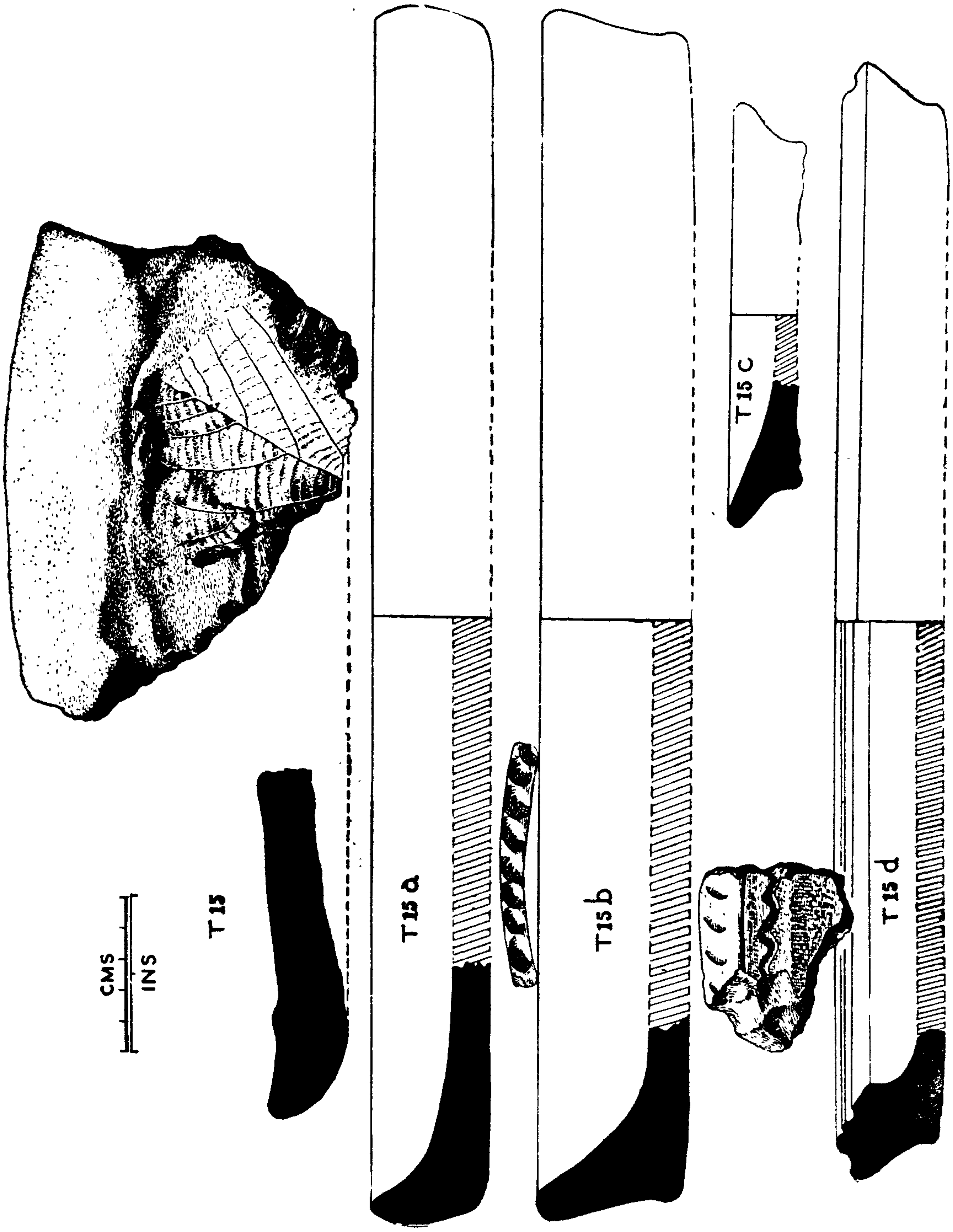


Fig. 96. Dough Plates from Nevasa.

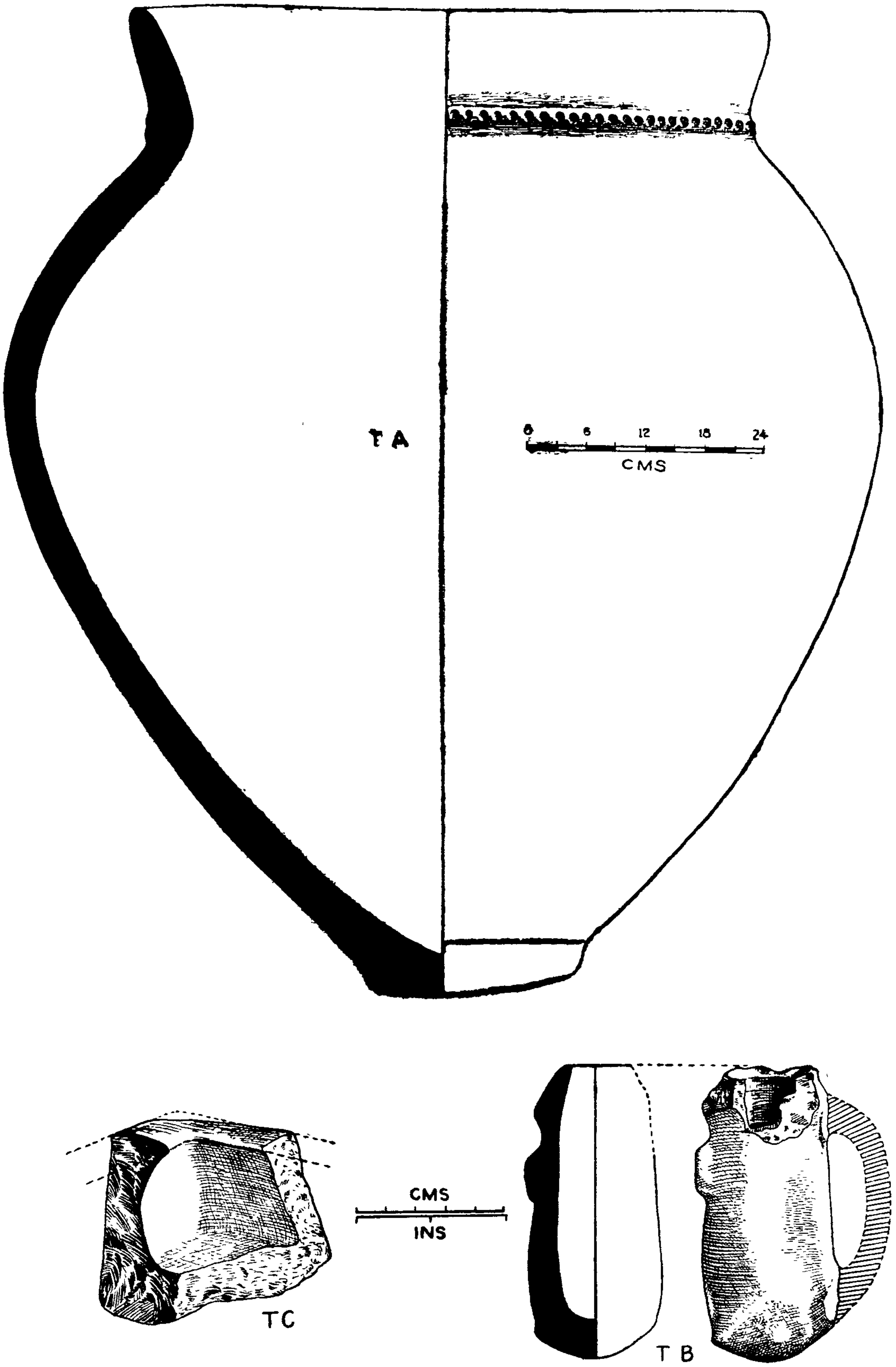


Fig. 97. (*a*) Storage Jar. (*b*) Theriomorphic Vessel. (*c*) Squarish Pot.

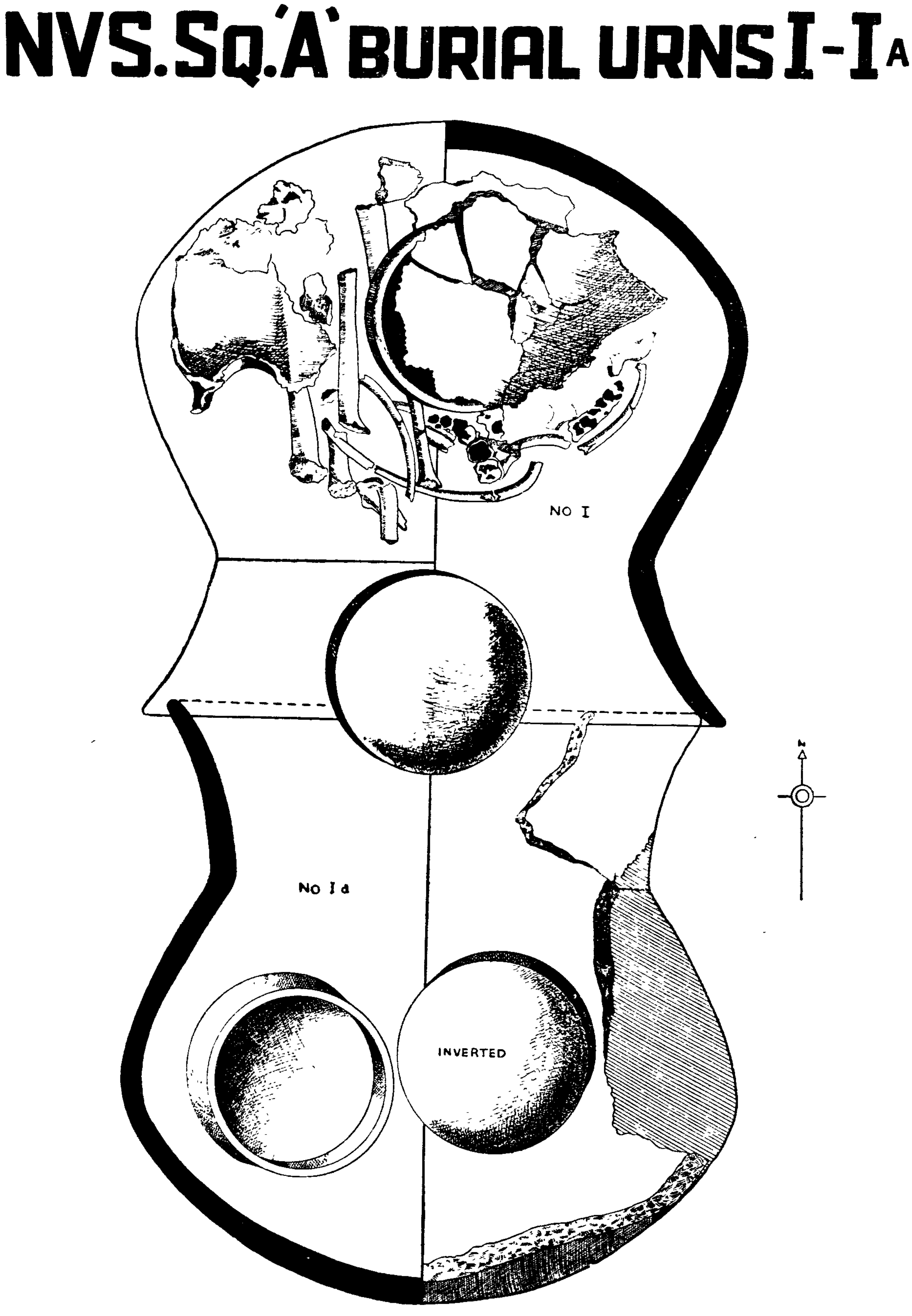


Fig. 98. Opened pot-burial, Nevasa.

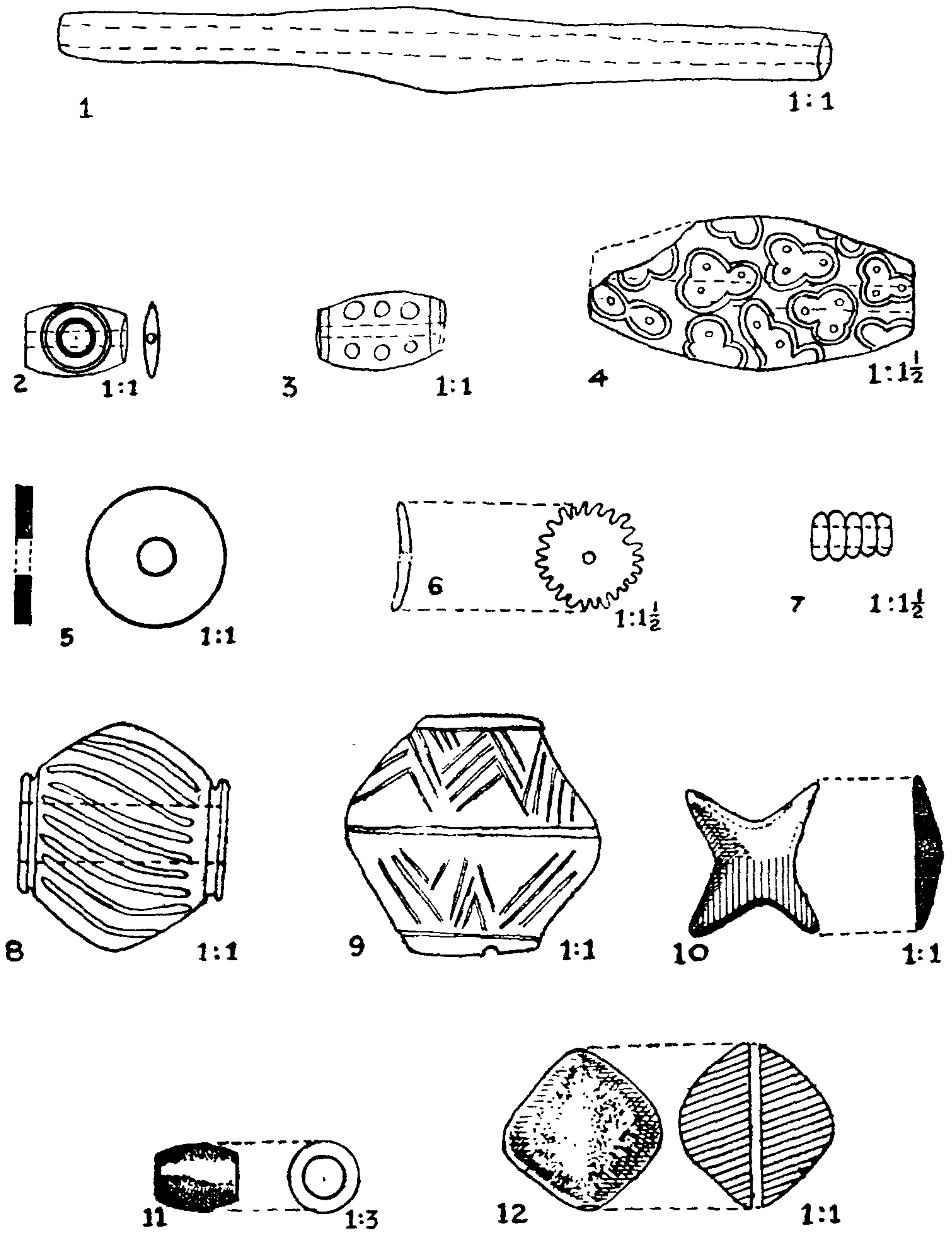


Fig. 101A. Typical Beads: Chalcolithic and Bronze Ages.

1. Chanhudaro: Mackay, Pl. LXXXI, 27. Terracotta.
2. Harappa: Vats, Pl. CXXX, 42: Eye bead. Faience.
3. Harappa: Vats, Pl. CXXX, 49: Eye bead. Faience.
4. Mohenjodaro : Marshall, Pl. CXLVI, 53: Steatite (inlay).
5. Chanhudaro: Mackay, Pl. LXXIII, 37: Steatite.
6. Mohenjodaro: Marshall, Pl. CXLV; Faience.
7. Mohenjodaro: Marshall, Pl. CXLVI: Faience.
8. Chanhudaro: Mackay, Pl. LXXXV, 25; Faience.
9. Ahar (Udaipur): Terracotta.
10. Navdatoli: Faience.
11. Chandoli: Copper.
12. Nevasa: Copper.

deposits of Period III,[140] whereas at Jorwe, swords are supposed to have been found, but melted away. The latter explanation was further confirmed by the discovery (in 1961) of a 7 inch dagger or spear-head with a faint mid-rib and flat antennae from Chandoli.[141] (*Pl. XXVIIb*) This is the first stratified occurrence of such a weapon in India.

Chalcedony blades supplied the most common tools like knives, with a single edge (penknife blade) or double edge (parallel sided blade), sickles (lunates and obliquely blunted points, and backed blades), awls or borers (thick elongated points) and scrapers. (*Fig. 102-5*)

Heavier tools like those of the carpenter and wood-cutter were made of dolerite (*Fig. 107*) and copper and known as polished or ground axe (various types), chisel, adze, copper-chisel, poker and axe. The copper axes are all of the flat type, with slightly tapering sides and straight, convex or flaring edges.[142] One type, however, had a shoulder, as a fragment from Navdatoli suggests.[143] These are certainly primitive when compared with those from Western Asia which have got a socket for hafting (in one piece with the blade). The polished stone axes are also of the pointed butt type with biconvex or lenticular section and a slightly convex or straight edge.

In addition to these, there was a thick-sided ringstone, which might have been used as a mace-head, but more probably as the weight of a digging stick for ploughing. These are of infrequent occurrence in the Deccan and probably indicate along with the rarity of boat-shaped querns, that the cultivated grains were not the main source of food. However, some sort of grain (*Jwari*, a kind of millet) was eaten, as suggested by the presence of millet oil used in anointing the child (before or after ? its death). The grains were crushed or pounded with plano-concave rubber stones, a number of which have been found, having their flat side pecked for, or made by, rubbing. (*Fig. 108*)

Food

Identifications of bones of animals recovered from Nevasa and Maski alone are available. Here again we have no very detailed reports regarding the age of the animals, but at Maski[144] the majority of the bones were of young ones. Within these limitations, however, it can be said that these included smaller, humpless, short-horned variety of cow or ox (*Bos indicus* Linnaeus or the zebu) the domesticated cattle, sheep and goat, buffalo, besides possibly snails (Banded Pond-snail, *viviparus bengalensis*) and mussels (*Parreyssia sp.*).

At Nevasa, in addition to these animals, deer were also eaten.[145] Thus we may say that beef, mutton, pork and venison, fresh water gastropods and

140. See, *Illustrated London News*, September 5, 1959, and *I.A.R.* 1958-59, p.

141. Cf. Robert Heine Geldern in *Man*, No. 151, Vol. LVI p. 186, 1956.

142. See, on its effectiveness, Wheeler, Mortimer, *The Indus Civilization*, p. 53.

143. This may have interesting typological significance.

144. Bhola Nath in *Maski* 1954, *A.I.*, No. 13 (1957), p. 123 and p. 125. Apparently there is a contradiction when it is said that Maski remains are of humpless variety, but included on p. 123 under the domestic humped cattle (*The Zebu or Bos Indicus* Linnaeus).

145. Sankalia, Deo, Ansari and Ehrhardt, *Nevasa*, p. 531, The statement on p. xv of this work, that pork (pig flesh), was also eaten is wrong.

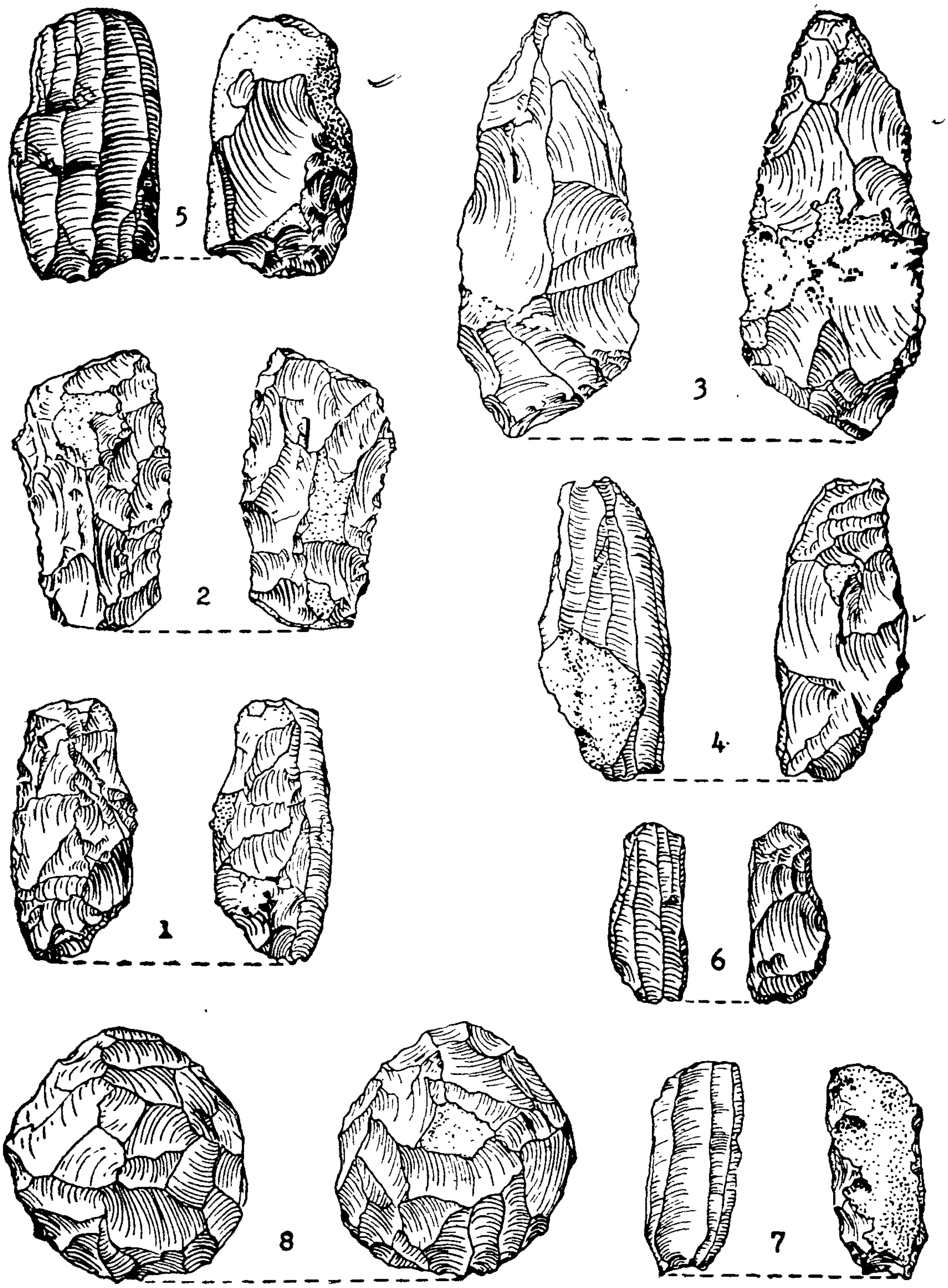


Fig. 102. Various types of cores for Chalcolithic blades.

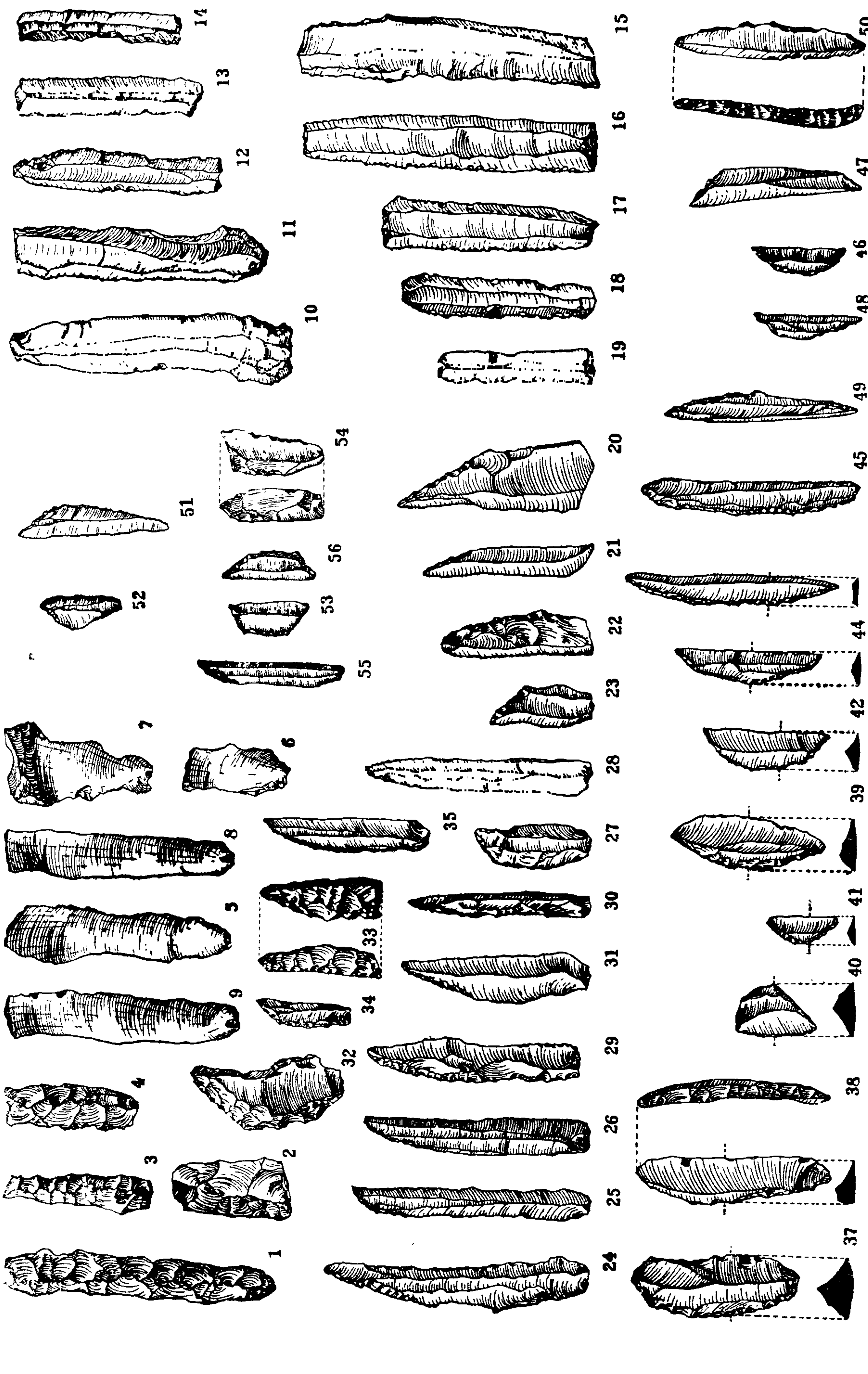


Fig. 103. Crested Ridge Flakes (1-4); Plunging Flakes (5-9); Parallel-sided Flakes (unused) (10-14); Parallel-sided Flakes (used) (15-19); Pen-knife blades (Right-sided) (20-23); (Left-sided) (24-27; 28; 31; 32-35); Lunates—i. (37-44); ii. (45-48); Trapezes (53-56).

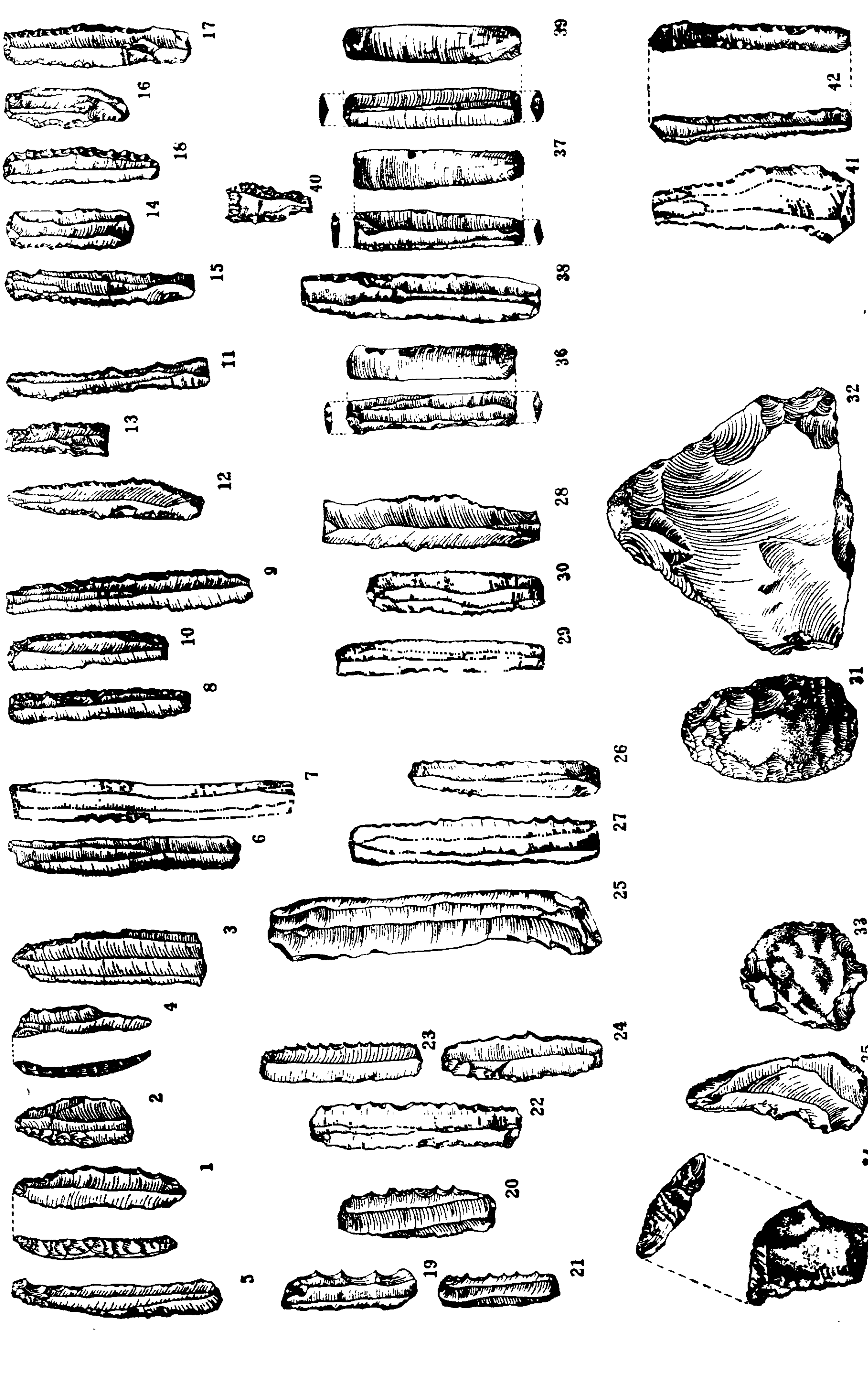


Fig. 104. Blades with straight blunted back; *i(a)* (1, 2); (*b*) (3, 4); (*c*) (5); *ii.* Partly blunted (6, 7); *iii.* Fully blunted (8-10); Blades fully retouched on both sides (11-13); Straight blunted back-*cum*-Scraper (14-18); Saws (19-30); Scrapers (31-32); 33-35; 36-39) Blades used on both sides (41-42).

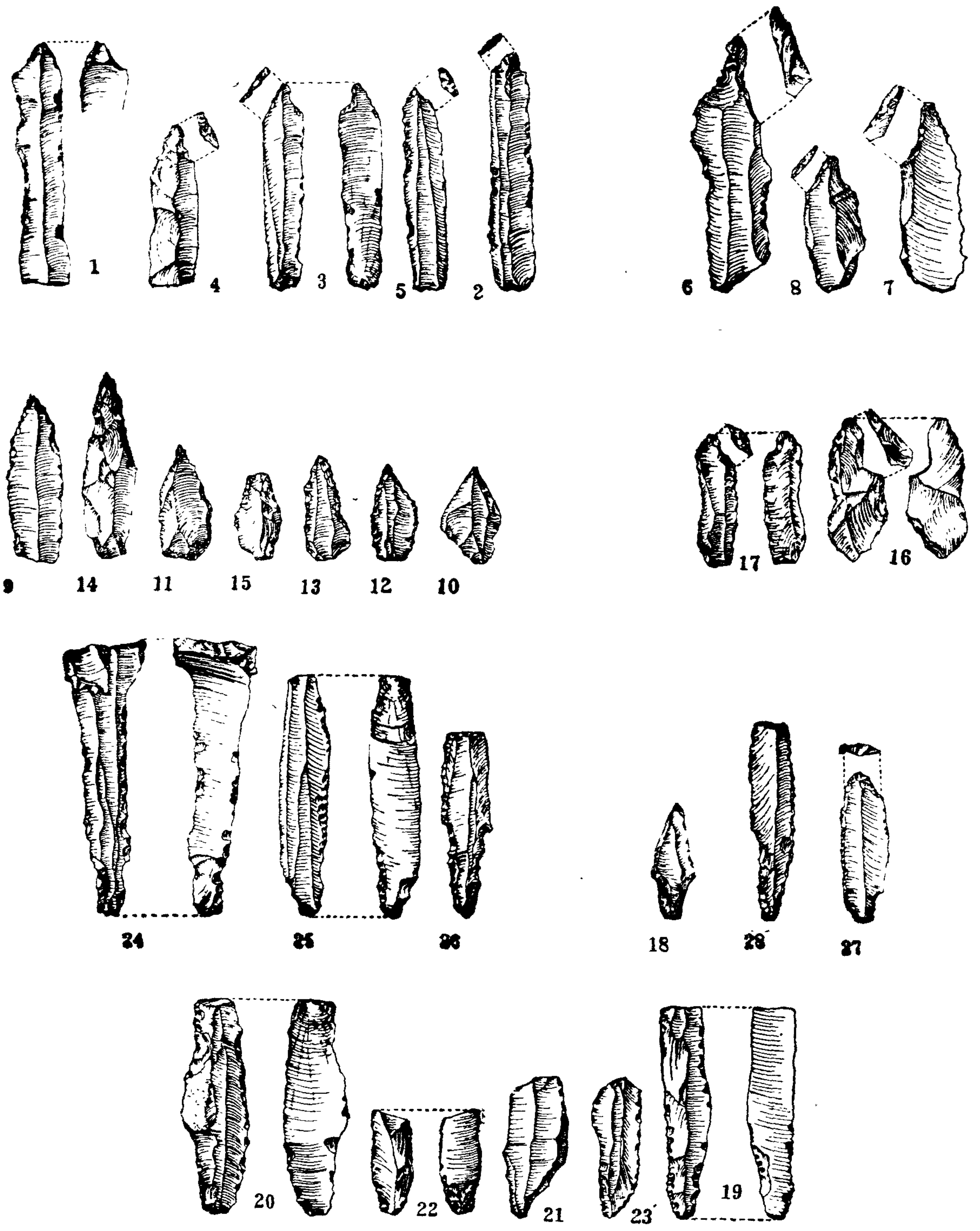


Fig. 105. Type 17, (*a*) Points (1-5); (*b*) Projecting Points (6-8); (*c*) Triangular Points (9-15); (*d*) Pointed Flakes (16-17); Type 18, Tanged Point (18) 18; Type 19, Tanged Flakes (*i*) Broken, (19-2); (*ii*) Intact and worked flakes (24-26); Type 20, Tanged Blade-*cum*-Scraper (27-28).

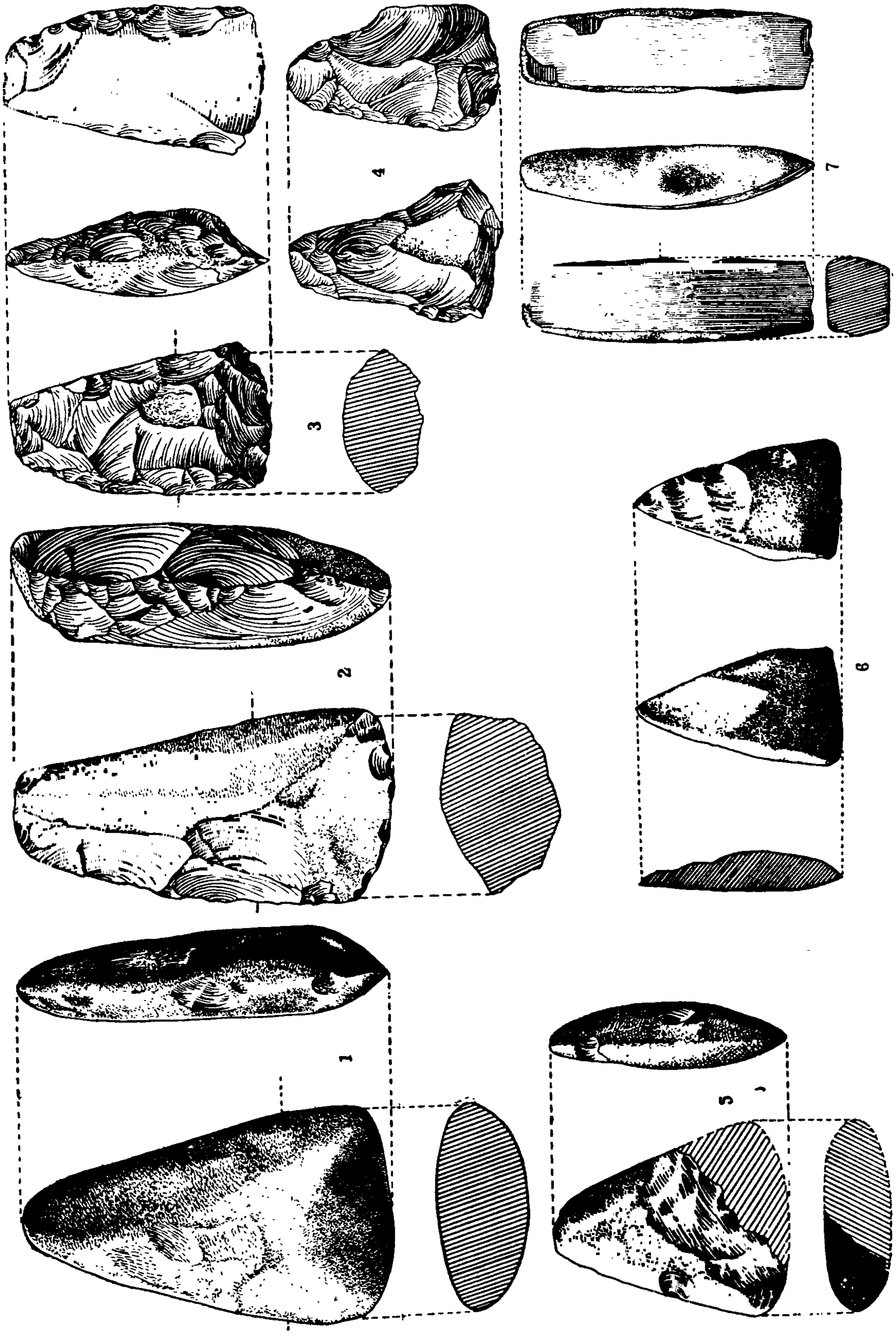


Fig. 107. Polished Stone Tools. Fully Polished Axes (1, 5); Partly Polished (2, 3); Incomplete (first stage) (4); Adze (6); Chisel (7).

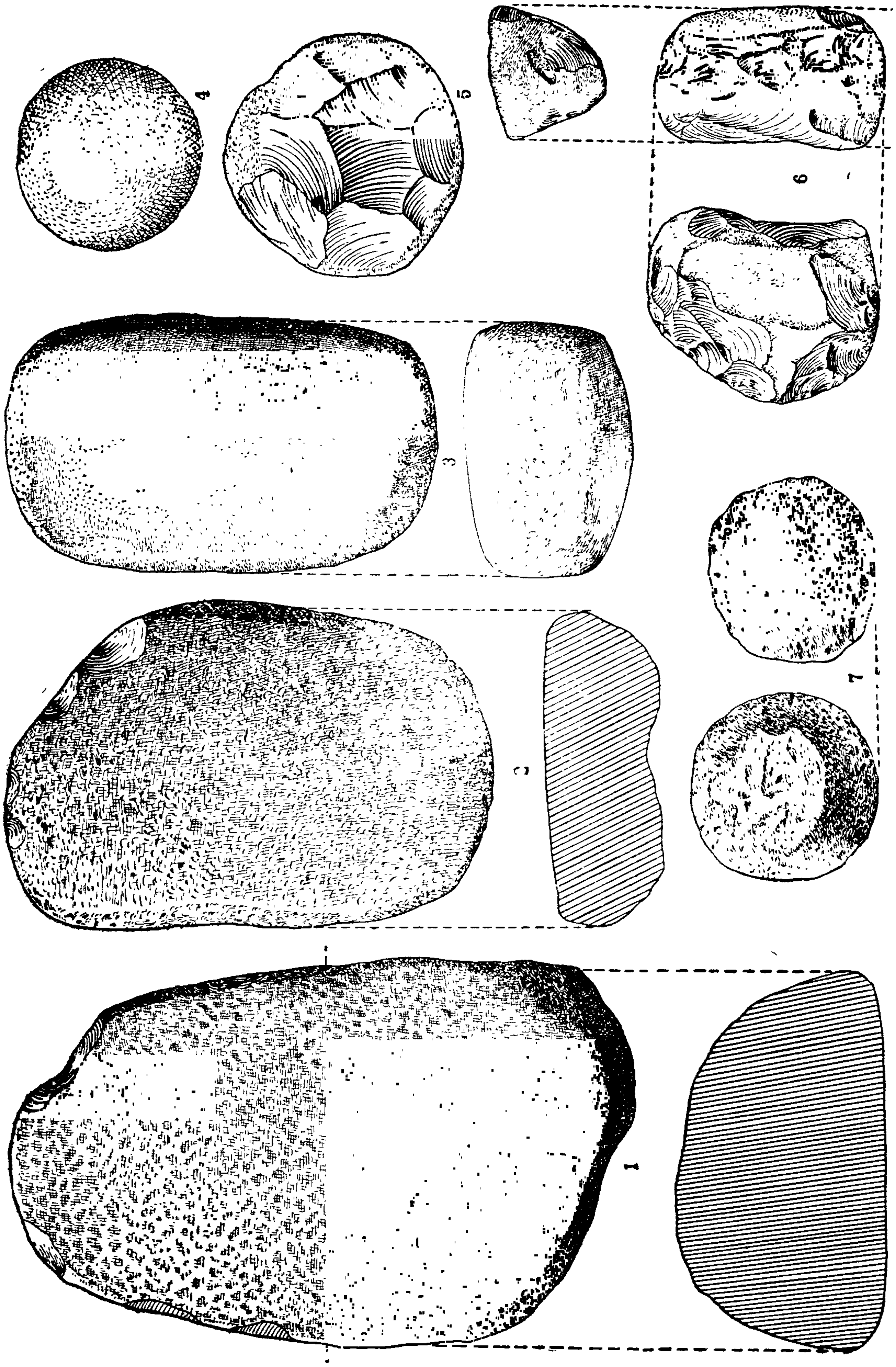


Fig. 108. Anvils (1-2); Muller (3); Stone Ball (4); Hammerstones (5-7).

land snails and possibly river fish formed the principal non-vegetarian diet of the people. To this we should add jungle fruits and berries and uncultivated grains though no remains of the last two have yet been found in any excavation in the Deccan. Hunting and animal grazing thus formed the main economy of life.

Burial (Pl. XXVIII)

Burial within the house floor or outside was the prevalent custom for disposing of the dead. The children without exception were buried in a wide-mouthed earthen pot (known as urn). If more than one, the urns were placed facing mouth to mouth. Instances of the use of three urns are seen both at Nevasa and Daimabad. At both these sites, the urns were kept horizontally on their sides after digging a shallow pit. But at Brahmagiri they were placed in a vertical position and their mouth covered by the bottom of another urn or vessel.

From close observation of a few excellent remains, it appears that a child's skeleton was either exposed and later the surviving parts were collected and buried, or it was cut up after death and distributed over the two urns, the one on the north having the head and the other on the south containing ribs, legs. etc. (*See Fig. 98*)

Older children and persons over 14, that is adolescents and adults, were buried full length in a large jar; if the latter was found to be short, another pot was used for covering the knees. The exact position varies. In burial 10, the dead body rested on the back, with the head to the left, the knees slightly drawn up and also turned to the left. In burial 19 of an older child (10 years) the position was similar, but the hands were crossed over the breast, and the head was considerably turned towards the right and upwards. Sometimes, as noticed at Nevasa, in 1959-60, the body lying in an extended position was covered by no less than five pots. Naturally, the under side was broken for the purpose. In rare cases, the body was placed on the bare ground after thinly plastering it with lime.

The children as well as the adults were often provided with bowls and spouted pots and beads or necklaces of copper and carnelian. In one instance last year, a copper necklace was found on the neck of a child, strung in silk and cotton threads,[146] while the one from Chandoli was strung with true flax. From the examination of the necklace it also appears that the child's body was smeared or anointed with cow dung and a kind of millet oil.

Thus though burial was the principal method, owing to varying needs of the situation, family or settlement or the customs of the tribes, certain differences existed which fall into five or six groups as follows :

CHILD BURIAL

I Vertical (e.g. Brahmagiri)

II Horizontal

- (*a*) Single urn
- (*b*) Double urn
- (*c*) Triple urn

146. In this season's (1960-61) excavation at Chandoli, a part of a small copper bead necklace retains the threads. These are identified by Dr. GULATI as of true flax.

ADULT BURIAL

I Laid extended in
- (*i*) Single large urn or jar
- (*ii*) Double jars
- (*iii*) Five jars covering the body
- (*iv*) Laid on the lime coated black soil or directly on the black soil.

It is worth inquiring how far these burial practices were responsible for moulding the habits of the Megalithic people who succeeded the Chalcolithic and Neolithic in South India, Mysore-Karnatak, Andhra. Their pottery is of course basically different, but the use of sarcophagii—huge pottery urns with legs and lids—might have something to do with the urns of the preceding period.

Whatever it be, economically they seem to have been in a pastoral-cum-hunting-cum-agricultural stage, living in small villages with closely set houses along the river bank. Stone in various ways still served them in all walks of life, copper being rare. This kind of life persisted until[147] it was suddenly changed by a new wave of people, from the north and the south, who came with a knowledge of iron, agriculture and town planning in about the 4th century B.C.

Another important question that needs to be posed, but which cannot be answered is this. So far only the Chalcolithic cultures of Mysore and the Deccan (including Khandesh) have given us an idea of the burial practices. We do not yet know how the people of this phase disposed of their dead in Malwa, Rajputana and Saurashtra (though it is now ascertained that at least one group practised burial in the Harappa Civilization). So it is possible that this was a purely Neolithic[148] practice which was adopted by the southward moving copper-using people.

Racial Origin ?

Who were this people racially? The skeletons from Brahmagiri,[149] Bahal, Daimabad, have not yet been studied; those from Nevasa are insufficient to give a more positive picture.

Out of thirty burials found at Nevasa (1954-56) there were three of persons whose ages have been calculated to be 6, 10 and 20 (or between 17 and 24), the last being that of a woman. In this case alone, it is possible to conjecture about the racial type of the person. From the prognathy, broad face with a wide nose (?) and long, narrow head, Professor EHRHARDT is reminded of the characteristics of the primitive people in the jungles of the Deccan.[150] The prognathy is seen in the other two skeletons as well. Thus there is great possibility that at least a section of the Nevasa population was of a primitive racial type.

147. It is difficult to be quite definite on this point. For, at Nevasa and Nasik a clean break between the Chalcolithic and the Early historic is indicated by a two feet weathered layer, the existence of which has been confirmed by Dr. G. G. MAJUMDAR's chemical analysis and the observation by Professor ZEUNER.

148. As is now evident from the excavations at Piklihal in Raichur District. For details see below.

149. The report on this was, it is understood, published recently, but not available to the writer.

150. In *From History to Prehistory at Nevasa*, p. 520.

Copper Hoards of the Gangetic Basin

Since LAL[151] exhaustively reviewed the material and the problem in 1951, not many finds have been reported from the Gangetic Basin. But three discoveries—one in the excavation at Navdatoli,[152] second at Chandoli[153] and the third of a hoard from Khurdi,[154] Parbatsar Tehsil, District Nagaur, now exhibited in the Jodhpur Museum necessitate a further consideration of the problem. (For an up-to-date map see *Fig. 110*).

Briefly, LAL came to the conclusion that the Gangetic and Orissa material —flat axes, bar celt, shouldered celt, rings, antennae sword, harpoons and anthropomorphic figures -- had nothing to do with the Fort Munro sword, socketed axe and the trunion celt, some of which were of bronze and Western Asiatic in origin, whereas the former were of pure copper, though, as WHEELER, has pointed out, a few are of bronze as well. Secondly, their distribution as well as affinity with the bar celt[155] and shouldered celt of stone which occur rather frequently in Eastern India suggested that the entire complex had an East Indian origin, confined to the Gangetic Basin and the trans-Vindhyan regions.

Further, since at two of the copper hoard sites, viz. Bisauli and Rajpur Parsu, an ill-fired, thick,, ochre-washed pottery was found, though without the association of any copper or other objects, and since such pottery also occurred in the lowest layer at Hastinapur below the Painted Grey Ware, it is tentatively suggested that the copper hoards might belong to the makers of such pottery of a pre-Grey Ware period. And since the latter are supposed to be Aryans, the former might be a pre-Aryan people, probably the Nishadas.

It is of course admitted that the whole chain of argument beginning with the Grey Ware is based on very insufficient evidence. And so far no absolute date could be had for any of the links in the chain.

The new evidence mentioned above, in the first place, extends the distribution. For the Khurdi hoard includes not only flat axes, but long bar celts and also a channel-spouted bowl. We have therefore to include Rajasthan along with the Gangetic Valley, Orissa and the Central Provinces.

Secondly, a shouldered celt of copper was found along with four others in Phase I at Navdatoli. This can be dated on C-14 evidence to at least 1500 B.C., if not earlier.

Further, Navdatoli (Phase III) has yielded a broken piece of dagger or sword with a midrib which might be similar to the one from Fatehgarh and Sarthauli, U.P. While an intact dagger or spear-head with short, flat sectioned antennae in one piece and cut afterwards from the tang was found at Chandoli, 40 miles north of Poona in association with Jorwe-Nevasa pottery as well as

151. LAL, B. B., *A.I.*, No. 7, 1951, pp. 20-39.

152. *I.A.R.*, 1957-58, p. 30.

153. *Ibid.*, 1960-61, p. 66.

154. *Ibid.*, p. 26.

155. GORDON, D. H., *The Prehistoric Background of Indian Culture*, p. 144 has argued that the stone bar celts are very likely derived from those of copper and not *vice versa*.

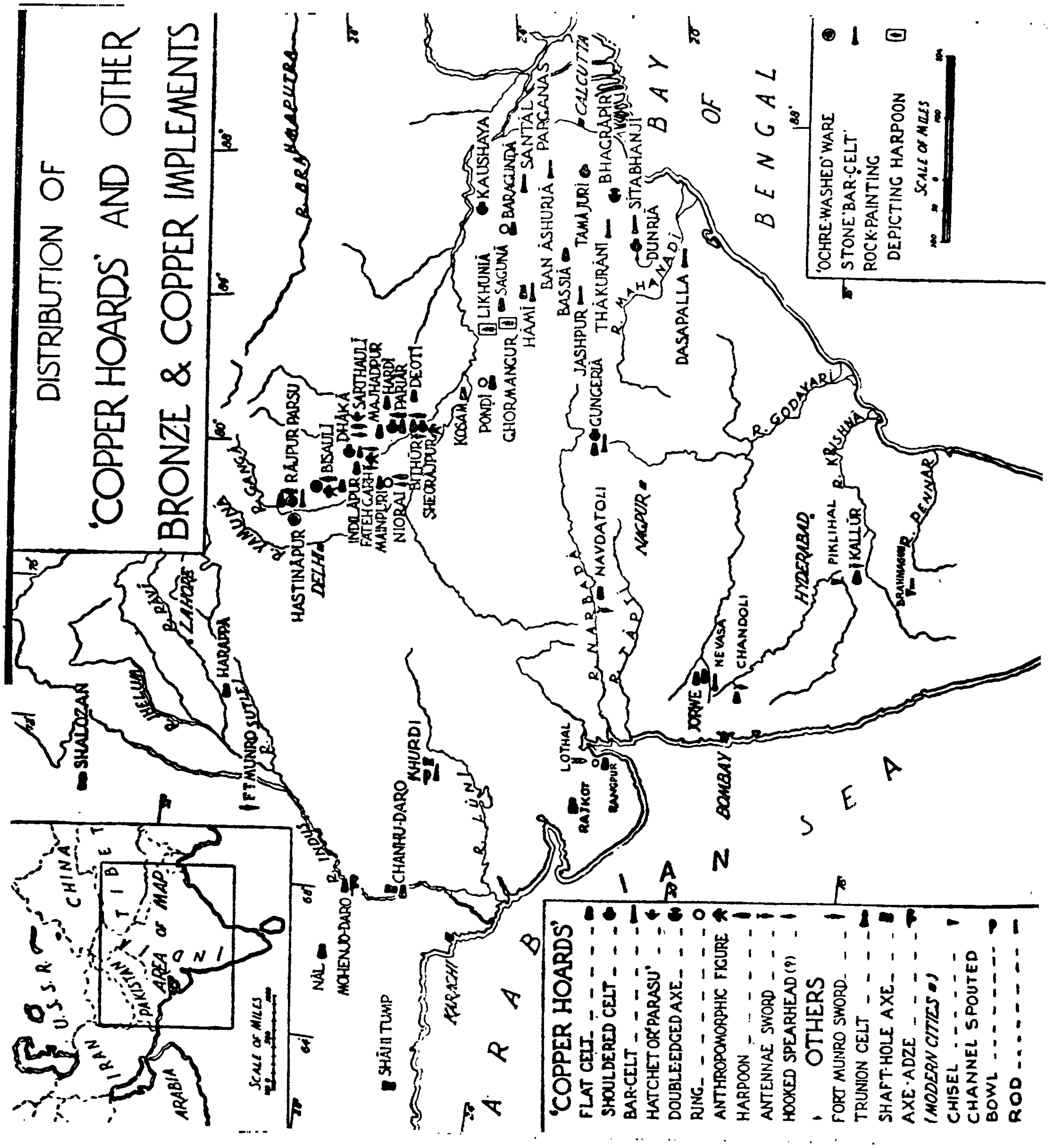


Fig. 110. Distribution of "Copper-hoards" in India. (Add Ahar, Udaipur, Rajasthan)

pottery of Navdatoli fabric and type. Nevasa pottery again on C-14 dating is of 1000 B.C. but is definitely earlier, as it occurs in Phase III at Navdatoli.

Thus at least four items viz. flat axe, shouldered celt, antennae sword or dagger and ring (which occurs at Jorwe and Rangpur) of the Gangetic hoard might be at least as old as 1500 B.C. and had a much wider distribution.[155a]

Now about their authorship. Though we do not know exactly who the Nevasa and Navdatoli people were, the peculiar pottery shapes as well as the stone blade industry of the latter suggest Iranian or Western Asiatic influence. Again, the pottery—fragments only—from Phase I at Nasik was described as ochre-washed and orange coloured etc. by the writer, because it was found rolled and weathered by water action. This was possibly because it was ill-fired. Similar is the case at the three Gangetic sites. It is therefore not quite impossible that the pottery of the Copper Hoard people was like that at Jorwe-Nevasa and/or Navdatoli, that is, a painted or unpainted red ware, but not well fired. It is indeed a pity that no shapes at all are known, and so no further comparison is possible. Whatever it be, the possibility of the Copper Hoard people being an earlier group of Aryans or Iranians cannot be ruled out.

The other alternative has already been suggested by the writer. This is that the bearers of the Nevasa-Navdatoli culure as well as of the Copper Hoard belonged to indigenous tribes, such as Nishadas, Pulindas, Savaras, some of whom though now quite primitive might have made, 3000-4000 years ago beautiful painted pottery and even copper tools and weapons. Or do these already suggest a fusion of cultures? Whether this copper work was of the Aryans or pre-Aryans, their nature suggests, as shown by WHEELER,[156] a hunting-fishing community, capable of indigenously producing such fine tools and weapons with the copper ore from Singhbhum in Bihar or/and Rajasthan.[157] The few swords might have belonged to the warrior group or class amongst those people.

NEOLITHIC CULTURES OF EASTERN AND SOUTH-EASTERN INDIA

Having reviewed the recently discovered Chalcolithic Cultures, we may now turn to the Neolithic Cultures, as per classification suggested above. (p. 154)

The first is the Eastern Neolithic.

The Eastern Neolithic Culture

This is Province C of KRISHNASWAMI. He further divides it into two groups: (1) the Assam Culture Complex, (2) the Bengal-Bihar-Orissa Culture Complex. Before going into details, it must be mentioned that so far no excavation of any kind has been carried out in this part of India. All the evidence is from the surface and it is very likely that the inferences based on a mere classification of tool-types may have to be severely revised when a much better documented evidence comes forth. Till now, besides the various surface discoveries, the best attempt to disentangle the varied evidence has been made by

155a. Since this was written, Ahar has yielded copper axes, their period dated to 18,00 B.C.

156. WHEELER, Sir MORTIMER, *Early India and Pakistan*, p. 126.

157. See also GORDON, *op. cit.*, p. 141 who also discusses well the routes by which the copper could have been transported.

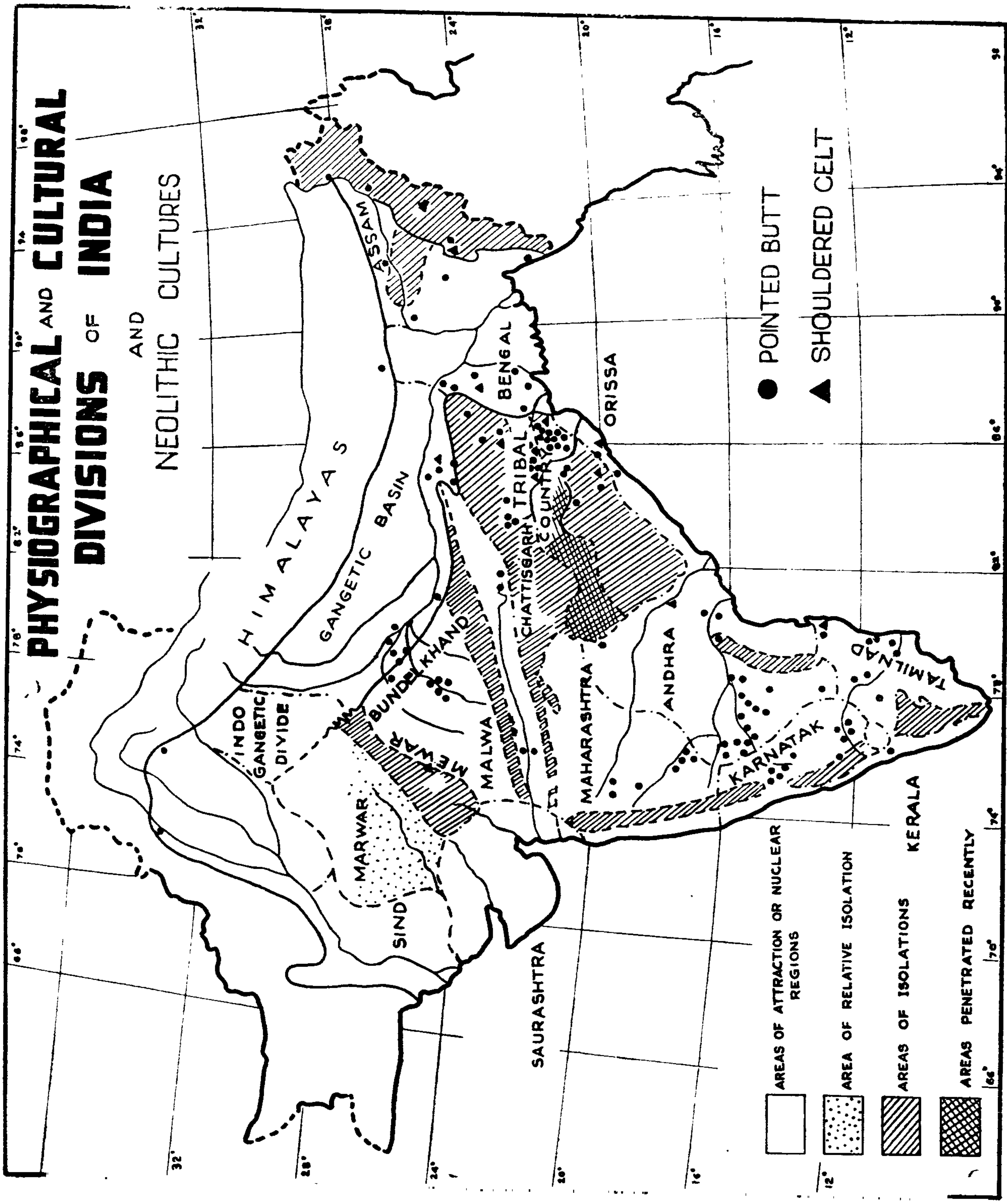


Fig. 111. Map showing the distribution of Ground or Polished Stone tools in India. (Add Eran on the Bina, Sagar District, M. P.)

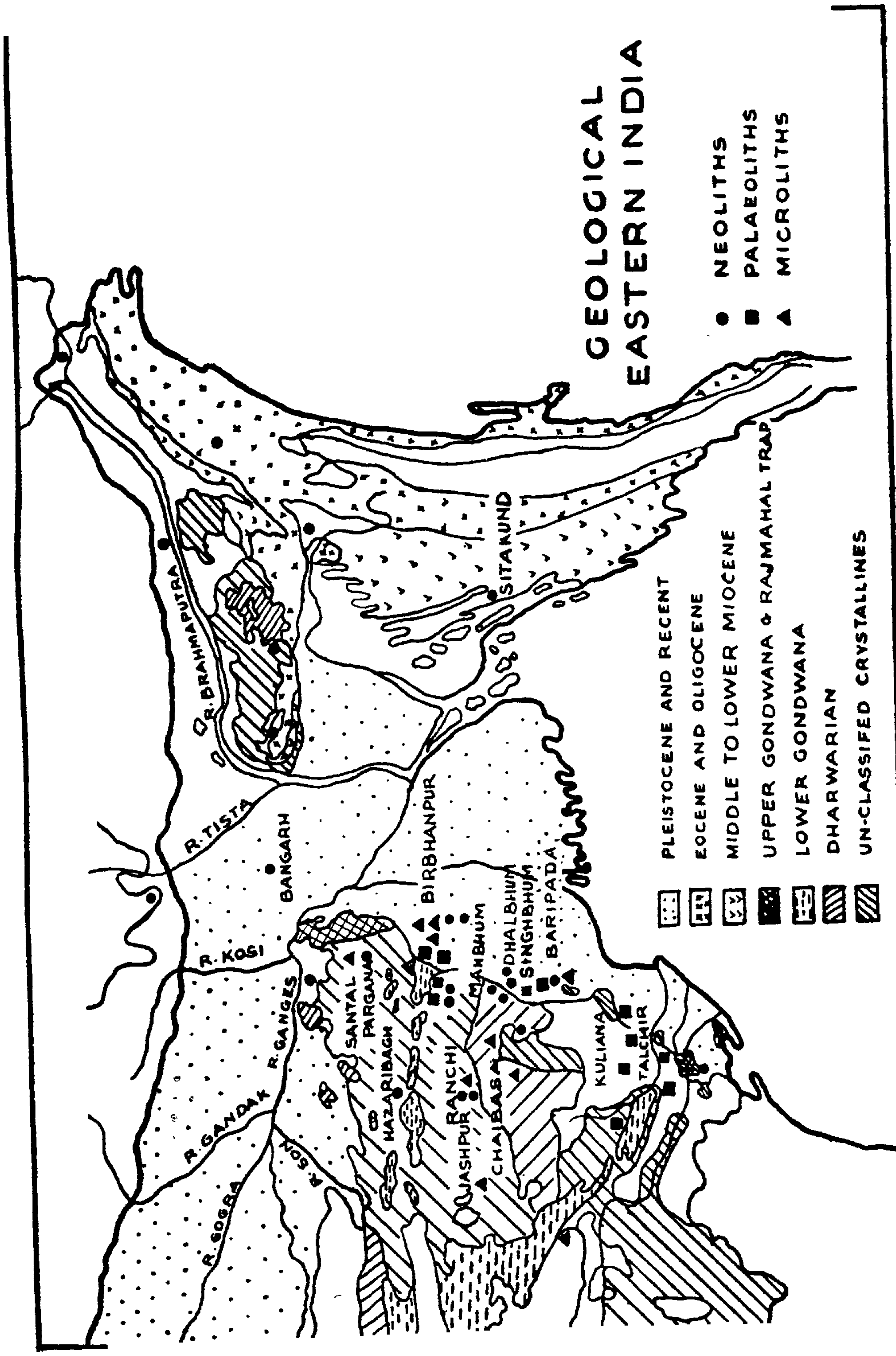


Fig. 112. Geological Eastern India, showing Stone Age sites (*Adapted with some additions from Dani*).

Dr. DANI.[158] He has tried to relate these with the tool types from the South-East Asia, which are often obtained from stratified excavations.[158a] This study has to a very great extent made obsolete the previous study of WORMAN.[159]

Assam Neolithic Culture (*See Fig. 112-113*)

It is unfortunate that this region which drew the attention of such a famous prehistorian as Sir JOHN LUBBOCK[160] (later Lord Avebury) in 1867 and which has since continued to yield occasional tools to several field workers,[161] has not yet been systematically explored. Besides the loose stone tools, the area abounds in such megalithic monuments as cists, dolmens, menhirs and carved stones. Some of the earlier writers like HUTTON[162] thought these to be "prehistoric."

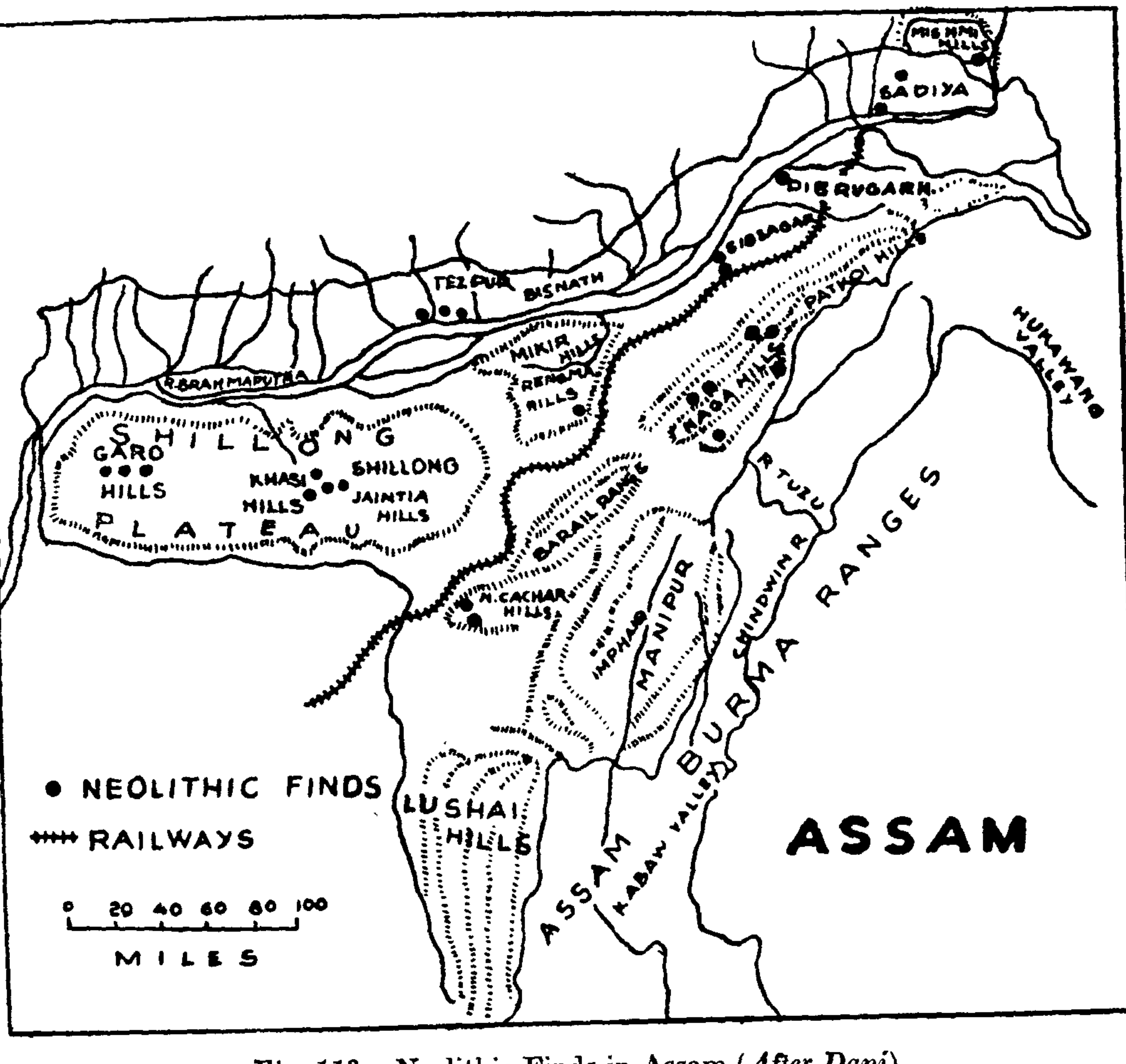


Fig. 113. Neolithic Finds in Assam (*After Dani*).

158. DANI, AHMAD HASAN, *Prehistory and Protohistory of Eastern India*, Calcutta, 1960. Henceforth references are made to DANI.

158a. Another useful study is of DR. F. R. ALLCHIN, "The Neolithic Stone Industry of the Santal Parganas", *BSOAS*, Vol. XXV, 1962, pp. 306-30.

159. WORMAN, E. C. (Jr.), "The Neolithic Problem in the Prehistory of India," *Journal of Washington Academy of Sciences*, (*J.W.A.S.*), Vol. 39, 1949, pp. 181-200.

160. LUBBOCK, Sir JOHN, "The Stone Tools of Assam," in *Atheneum*, June 22, 1867, London. After DANI, *op. cit.*, p. 41.

161. See, DANI, *op. cit.*

162. HUTTON, J. H., "Prehistory of Assam," in *Man in India*, Vol. VIII, 1928, 228-32; and BARUA, K. L., *J.A.R.S.*, Vol. 7, 1939, pp. 6-18 and 35-41; and CHAUDHURI, Pratap, "Neolithic Culture in Kamarupa," *J.A.R.S.*, Vol. XI, 1944, pp. 41-47.

As yet nothing definite is known either way. DANI's exploration, though very much limited, suggests that the neolithic tools bear no relation to these monuments. The question thus remains very much open.

Hence in the absence of any better data, the existing knowledge of the neolithic tools is here presented after DANI, with our comments, wherever necessary.

Though the whole of this area is called Assam, geographically it falls into various zones. In each of these zones, the assemblage of tools shows an innate relation in material and form to the geological and geographical conditions of the zone. However, one thing underlines all these groups and that is the technique of manufacture. This is common to all the zones, though slight differentiation in forms may be seen from region to region. Unlike in South India or the Deccan, the raw material consists of flat slabs, probably from stream beds. There was little prior chipping or flaking and grinding or smoothing of these slabs. By slight battering or hammering, and grinding of the edge either on one side or both the sides, they were turned into tools.[163] In all six subzones may be differentiated :[164]

1. *Sadiya Frontier*: Chief material—jadeite, though tools of gneiss and dolerite also occur infrequently; less typological variation than in Cachar Hills. Main types show affinity with ground tools from Yunnan, also the nearest source of jadeite.

2. *Naga Hills*: Chief material gneiss; others in much smaller proportion are jadeite, dolerite, limestone, sandstone, slate, chert. Varied and distinctive tool types. Besides the common types found all over Assam, we have here the gouge adze found abundantly in Burma, Malaya, Siam, Laos, Cambodia along with tanged axe-blade and the wedge blade special to this region.

3-5. *Khasi, Garo and Cachar Hills*: Chief material sandstone and tools very much weathered. Most of the types seem to be derived from Cachar Hills and remarkably similar to the developed tools of Upper Burma.

6. *Brahmaputra Valley*: Mostly from Tezpur District. Material sandstone. Tools made of smoothed pebbles.

Tool Types

Assam has two main types of ground tools: I Facetted Tool, II. Shouldered Tool.

In addition, there are—III. Rounded Butt Axe, IV. Axe with broad cutting-edge, V. Splayed Axe, VI. Tanged Axe, VII. Wedge Blades, VIII. Grooved Hammerstones.

Fig. I

I Facetted Tool (See Fig. 114)

A facetted tool is so called because it has a number of facets obtained by grinding. In shape and cross-section, it is rectangular.

163. DANI, *op. cit.*, p. 42.
164. *Ibid.*, pp. 44-6.

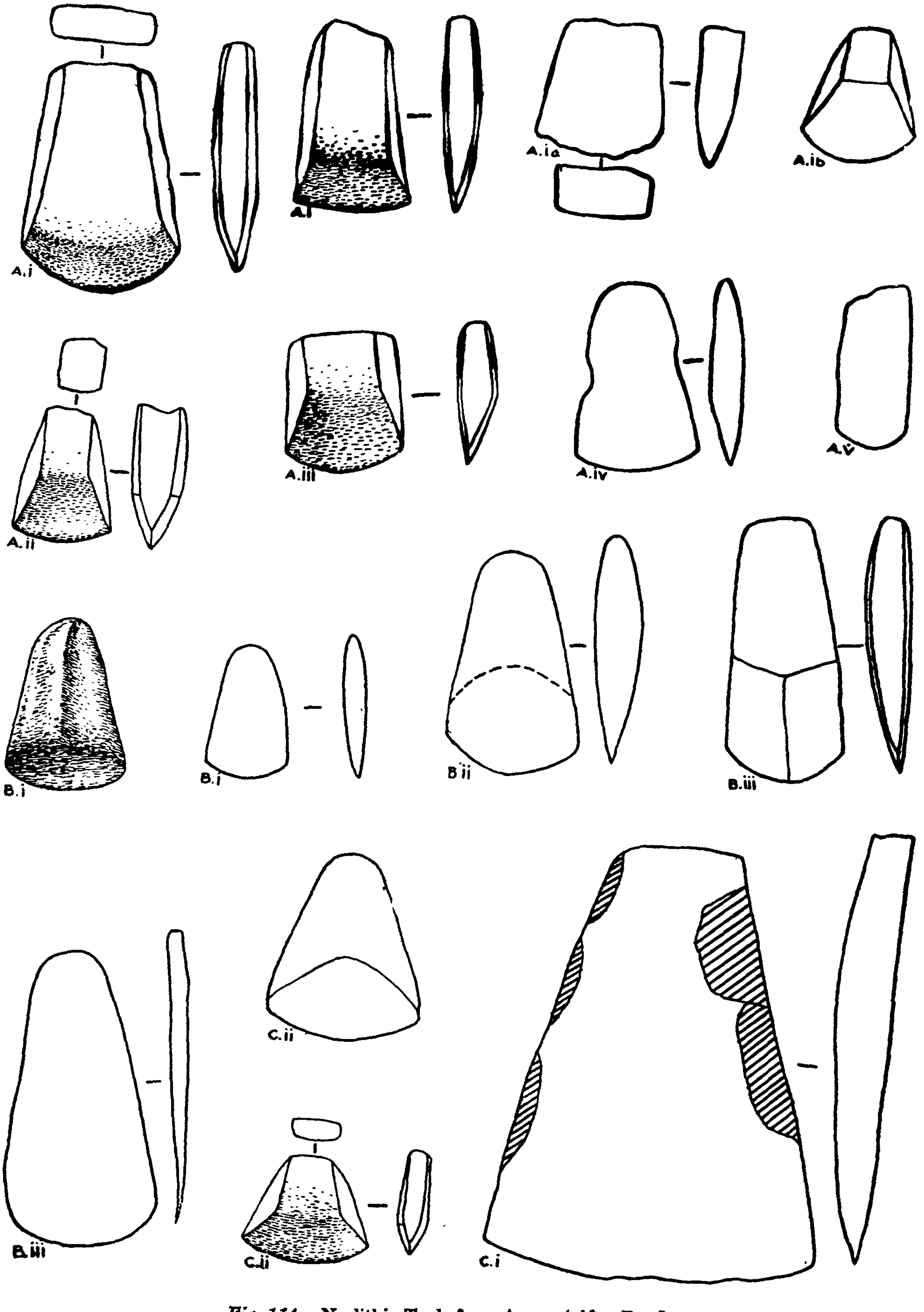


Fig. 114. Neolithic Tools from Assam (*After Dani*).

According to the nature of the cutting edge DANI sub-divides it into five varieties :

Ai Facetted tool with curvilinear or convex slightly flaring edge, and gently tapering rectangular butt. All the four sides are ground, one surface is convex, and the other almost flat. Their junction forms the cutting edge. So far only one specimen is found in North Cachar Hills, though well known in South-East Asia. Jadeite.

Aii Facetted tool with convex median cutting edge made by bifacial grinding, with a narrower butt, having a square section. North Cachar Hills. Gneiss.

Aiii Facetted tool with unifacially ground, straight or convex cutting edge. The cutting edge, as in Variety Ai, is made by the junction of a flat undersurface, and an upper-surface. Sharply inclined or bevelled and ground at the edge.[165] This definitely shows that it was the intention of the artisan to make the edge by working or grinding the upper face.

Aiv Facetted tool with side notches.[166] In addition to the ground faces and a median edge, it has semi-circular notches, produced by grinding, to facilitate better hafting. Tool hafted like an adze with handle perpendicular to the cutting edge.

Av Facetted tool with parallel sides.[167]

In Sadiya Frontier Zone, only varieties Ai and Aiii are found, and the material is in two cases basalt, and in one bone.[168] This seems to be unique.[169]

The Naga Hills is archaeologically regarded as one zone, though there are several Naga tribes. All the five varieties[170] of facetted tool occur.

In Garo Hills, only two varieties Ai and Aiii of facetted tools are seen, but DANI classifies further variety Ai into Aia and Aib. Thus there are facetted tools with :

1. Curvilinear or convex edge and tapering butt ;
2. Curvilinear edge and rectangular in shape ;[171]
3. Curvilinear edge and trapezoidal in shape.[172]

Sandstone is preferred, but examples in limestone, basalt and even chert are known.

No tool of this type is reported from the Brahmaputra valley, while from Khasi Hills[173] the variety Av, namely a long one with parallel sides and made of slate is mentioned.

165. *Ibid.*, pl. 6, nos. 3-5, 7. Here Fig. 114.

166. *Ibid.*, p. 63, pl. 10, 41.

167. *Ibid.*, p. 64 and illustration in BARRON, *J.R.A.I.*, Vol. I, 1872, pp. lxii-xiii ; (The sides in these two tools are not really parallel as DANI says) and STEEL, E. H., in *P.A.S.B.*, 1870, pp. 267-68.

168. *Ibid.*, pl. 8, nos. 20, 22 and 21. Here fig.

169. *Ibid.*, pl. 8, no. 22.

170. *Ibid.*, pl. 10, nos. 34-37, 38, 39, 40, 41.

171. *Ibid.*, pp. 70-1 and pl. 14, nos. 75-77.

172. *Ibid.*, pl. 14, nos. 82-87. Since there is no fundamental differences in shape, between these and othres these are not reproduced here.

173. *Ibid.*, p. 13, no. 72, here Fig. 114.

II. *The Shouldered Tool* (*Pl. XXXI, 1-3* and *Fig. 115*)

This is also a type of facetted tool having its butt-end prolonged into a tenon to provide a suitable haft.

According to the regularity or irregularity of the tenon and the body, and the relation or proportion of the length of the body to its breadth, DANI distinguishes five varieties :

Ei	Regular and broad[174]
Eii	Regular and long[175]
Eiii	Crescentic with a long tenon[176]
Eiv	Irregular and broad[177]
Ev	Irregular and long.[178]

In some instances both the tenon and the body are square and the right angle between them is sharply cut or sawed by a wire-like instrument, probably a metal one. In others this angle is obtuse or even rounded, because it is formed by haphazard chipping and grinding.

The first four varieties are found in the Cachar Hill Zone. Usually the material is limestone, but in one instance variety Ei is in fossil wood. The specimen of variety Eiii[179] is said to be unique. It has a small crescent shaped body bifacially ground to produce a sharp cutting edge. The tenon is square in section, tapering slightly towards the butt. The angles are sharply cut.

Bronze and socketed examples are cited from Burma and South-East Asia.

A comparable dated specimen may be cited here from Phase I (c. 1800 B.C.) of the excavations at Navdatoli, opposite Maheshwar.[180] Now only the thick crescentic lower portion is extent. It is broken from the shoulders which were fairly regular.

Sadiya Frontier Zone has none of these tools. The Khasi Hill has one irregular variety of slate.[181] But all the five varieties are found in the Naga Hills.[182] The material is varied.

The Garo Hills have so far produced varieties Eiv and Ev only,[183] slate and sandstone sharing most of the specimens.

174. *Ibid.*, pl. 7, no. 12.
175. *Ibid.*, pl. 7, no. 14.
176. *Ibid.*, pl. 7, no. 16.
177. *Ibid.*, pl. 16, 98.
178. *Ibid.*, pl. 16, 101.
179. Here Fig. 115, Eiii.
180. *I.A.R.*, 1957-58, pl. Here Fig.
181. DANI, *op. cit.*, p. 70, pl. 13, 78.
182. *Ibid.*, pl. 11, no. 47, 48-50, Here only one is illustrated.
183. *Ibid.*, p. 73, pl. 16, 98-103.

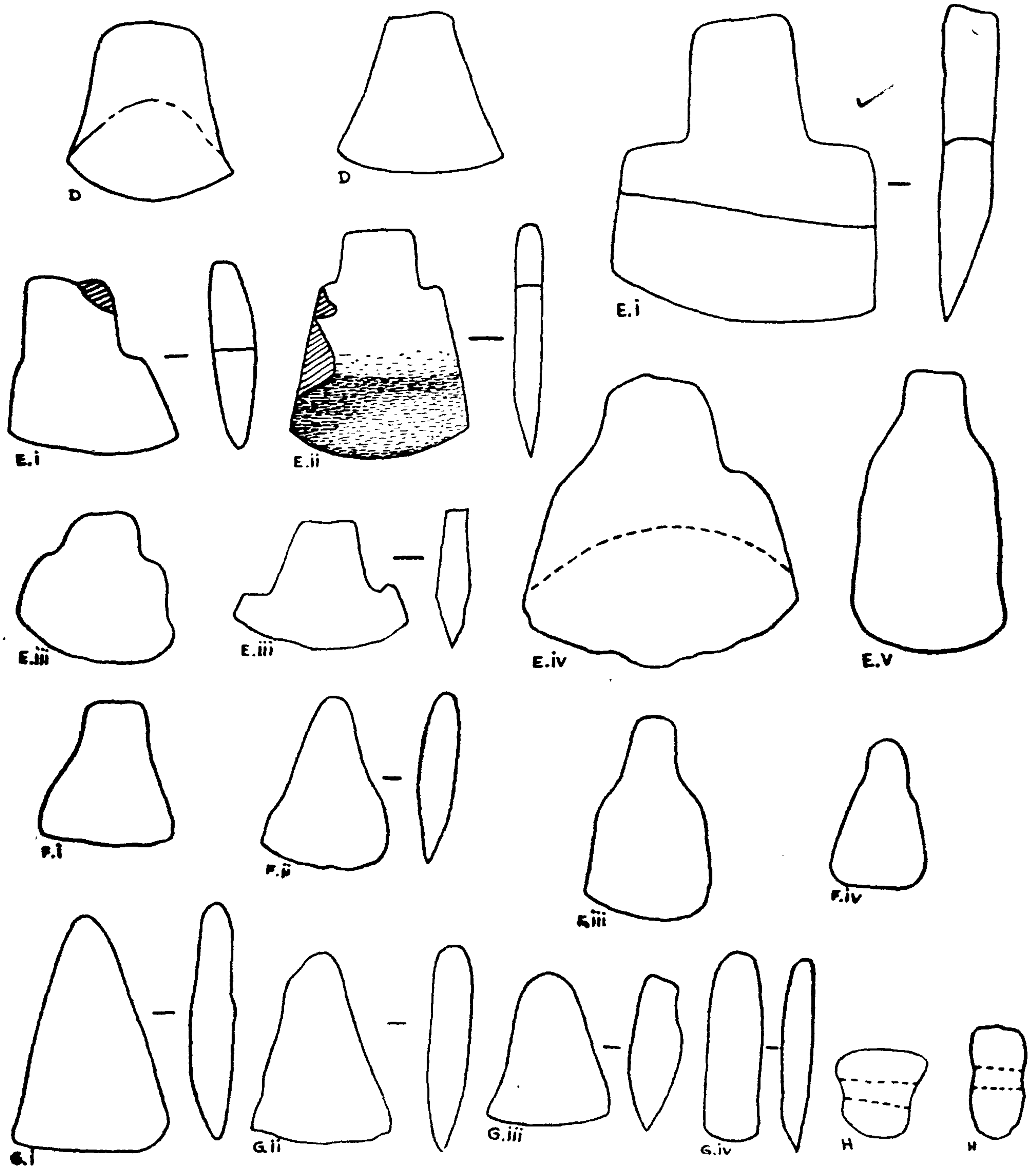


Fig. 115. Neolithic Tools from Assam (*After Dani*).

III(B) *Rounded-Butt Axe* (*Fig. 114*)

This tool type superficially resembles the polished pointed butt stone axe, which has a very wide distribution in India (including Pakistan).[184] But as DANI points out there are important technical differences between the Assam and the other Indian types.

The Assam rounded butt axe has rarely a median cutting edge, as in the Indian one; secondly the longitudinal section is planoconvex, being flat on one face and the other curved or convex right from the edge to the butt. The cutting edge is formed by the meeting of the flat and the convex faces, both being ground, the former being particularly so by what is known as tertiary grinding.

If this is so, the axe is like the shoe-last celt, a specimen of which was found by SUBBARAO at Sangankallu.[185] However, complications arise when DANI earlier [186] defines it as " a form of long axe, varying from oval to lenticular in cross section, with rounded butt, sometimes narrowing to a point, the sides tapering slightly convexly, with one broad face almost flat and the other curved." It is clear as the illustrations also show that we have : (*a*) types which are plano-convex in section, (*b*) types which have a biconvex or lenticular section.

The above type (*b*) of Assam must be included in the general Indian type.[186a]

This is also obvious from DANI's sub-types. He recognizes three varieties : (*Fig. 114*)

- Bi Rounded Butt Axe with bifacially median edge ;
- Bii Rounded Butt Axe with unifacially ground edge ;
- Biii Rounded Butt Axe of curvilinear type. The cross-section is plano-convex and would be equivalent to our type (*a*), mentioned above.

The distribution is as follows. In the Cachar Hill zone only variety Bi[187] (of arnecious clay or slate); the Sadiya Frontier Zone exhibits all the three varieties,[188] the material varying between jadeite, gneiss and limestone. The Naga Hills have very few of this type of tool, and these belong to Biii[189] or our sub-type (*a*). Of course, the specimens differ in details. A rare type is here reproduced.[190] It has a ground flat face, while the other is not only convex but also beautifully ground as to produce two sub-faces separated by a low ridge. Hence the tool is described[191] as a gouge adze or pick-adze.

184. *A.I.*, No. 4, 1947, Fig. and No. 7, 1950, Fig. 51.

185. SUBBARAO, *op. cit.*, p. 34, pl. XX, 10-13, particularly fine is 10a.

186. DANI, *op. cit.*, pl. 52.

186a. I am glad to note Dr. F. R. ALLCHIN (*BSOAS*, 1962, p. 323) while discussing the neolithic tools from the Santal Parganas, comes to the same conclusion. He would simply call such tools and their analogues " Indian axes and Indian axe-hammers " respectively.

187. *Ibid.*, p. 57, pl. 6, 6.

188. *Ibid.*, p. 61, pl. 9, nos. 25-26, 28 ; nos. 27, 29 ; pl. 8, 24. pl. 9, 30-31, respectively.

189. *Ibid.*, p. 64, pl. 10, nos. 42-44 ; pl. 11, no. 45.

190. Here Fig. 114, Biii.

191. See, DANI, *op. cit.*, p. 65 for references.

The Garo Hills have so far yielded only variety Biii,[192] our type (*a*), being very flat.[193]

From this distribution it would be indeed difficult to argue much about the cultural influences. The Garo and Naga Hills have the true plano-convex type Biii or (*a*), whereas Sadiya and the extreme north-eastern point have all the three, which may indicate contact with Burma.

IV *Axe with broad cutting edge* (*Fig. 115*)

This axe type with acutely tapering sides and broad cutting edge is regarded by DANI as a variant of type B, viz. the rounded butt axe. Parallels can be cited from other parts of India, but with this difference that the Assam specimens are very thin and since made of soft stone were probably used for loosening the earth as hoes and not as carpenter's tools.

According to their size, DANI divides them into two sub-varieties:

Ci. Axe with broad cutting edge (large)

Cii. Axe with broad cutting edge (small)

The distribution is as follows:

Cachar Hills have both the varieties.[194] Sadiya zone has none. Naga Hills have two doubtful specimens.

Garo Hills have both the varieties[195]; the material is uniformly sandstone. The sub-variety Cii from the illustration seems to have facetted sides.

V *Splayed Axe* (*Fig. 115*)

This is type D of DANI. As the name connotes, the tool has a flaring or outgoing cutting edge, concave sides, which terminate in a roughly cut narrow butt. As pointed out elsewhere such a shape is not natural to stone-cutting, but seems to be an imitation of a copper-bronze original. In metals hammering etc. cause the edge to flare out. Whatever be the true cause of the origin of such axe forms, its distribution is very instructive.

In Assam it occurs in Cachar and Garo Hills,[196] but rarely, and is absent in the Naga and Khasi Hills as well as in Sadiya Frontier Zone and the Brahmaputra Valley.

Outside, it is said to be common in Yunnan and other South-Eastern countries, whereas in the rest of India, the type is represented in metal (copper and bronze). C.14 dates are available for those from Navdatoli,[197] and Jorwe-

192. *Ibid.*, p. 72, pl. 15, nos. 88-90 and 92.
193. Here Fig. 114.
194. DANI, *op. cit.*, p. 37, pl. 6, no. 8, and pl. 7, nos. 9-10.
195. *Ibid.*, p. 73, pl. 15, 93, 94-96.
196. DANI, *op. cit.*, p. 58, pl. 7, 11 and p. 73, pl. 15, no. 97.
197. *I.A.R.*, 1957-58, pl. XXXVII. Here Pl. XXV.

Nevasa.[198] Are these copies of Indian metal prototypes or the Chinese?[199] For the site at Shek Pek Lantau, Hong Kong, which belongs to a proto-historic Hong Kong culture has yielded moulds of such axes. Or, are even the Indian metal types of a foreign—Far Eastern—origin? It is not so easy to decide unless the intermediate stations on both the routes—Indian (for the earliest are at least of 2500 B.C.) as well as Chinese or Far Eastern—are known.

VI. *Tanged Axe (Fig. 115)*

The Tanged Axe is type F of DANI. It is a comparatively small tool (made wholly on a suitable pebble) with a straight broad ground edge and rectangular body tapering into a small, short butt. Irregular notches at the taper give the effect of a tenon to the butt. The cutting edge is made by grinding, but the rest of the tool shows no sign of flaking or battering. It has slight shoulders at the butt, and may be derived from or related to the shouldered tool. In spite of this obvious similarity, DANI says that both are quite different in the actual form of the cutting edge as well as in the technique of manufacture. This type of axe is confined to the Naga Hills and was probably hafted in a bamboo tube, and used as digging stick.

DANI makes out four sub-varieties, according to the nature or form of the tenon.

Fi	Tanged Axe, broad body and edge with square or rectangular tenon.[200]
Fii	Tanged Axe, broad body and edge with round tenon.[201]
Fiii	Tanged Axe, long body, broad edge, flat topped, round tenon.[202]
Fiv	Tanged Axe, long or broad body, broad edge, pointed tenon, round in section.[203]

Each sub-variety is here illustrated.[204]

VII(G) *Wedge-blades (Fig. 115)*

These are triangular axes of varying length, with a narrow rounded butt, and a broad or narrow cutting edge. Since there are no signs of hammering and grinding, it appears that pebbles of suitable size, shape and smoothness were selected.

These tools are again limited to the Naga Hills. DANI's statement that " it has not been possible for him to find parallels in India or in South East Asia, except in Burma " contradicts the later one, " In other parts of India wedge-shaped axes have been found."[204a] Not much of preparation of the tool except the grinding at the edge, is involved in these Assam tools, whereas in the rest of India, considerable flaking, hammering and grinding was required to achieve these simple shapes.

198. SANKALIA and DEO, *Excavations at Nasik and Jorwe*, pl. XXXIII, nos. 4 and 6.
199. DANI, *op. cit.*, pp. 54 and 68.
200. *Ibid.*, p. 67, pl. 12, nos. 52-53, 56-57.
201. *Ibid.*, pl. 12, no. 58.
202. *Ibid.*, pl. 12, nos. 54-55.
203. *Ibid.*, pl. 12, no. 59.
204. Here Fig. 115.
204a. Probably these could be compared with "Small celt hammers" of ALLCHIN from Santal Parganas. *op. cit.*, p. 316.

The tools are so far found only in the Naga Hills, and are divisible into four sub-types :

Gi	Large, wedge-shaped, triangular in shape with pointed butt.[205]
Gii	Medium, triangular, broad cutting edge and round butt.[206]
Giii	Small or medium, triangular with straight cutting edge.[207]
Giv	Long with parallel sides and narrow or broad cutting edge.[208]

In this no. 66 should really form a distinct group, for it is not triangular, as the rest more or less are.

Typical specimen of each variety is here reproduced.[209]

VIII(H) *Grooved Hammerstone* (*Fig. 115*)

In Assam this type is documented from one site only, Bishnath in Tezpur district,[210] Brahmaputra Valley; since it is rare in South-East Asia, and of common occurrence, particularly in South-East India, its one of the centres seems to be the latter region.

These seemed to have been made, as explained by COGGIN BROWN, by splitting an elongated, ovoid pebble transversely. The broken end was then ground until it assumed a smooth slightly convex surface. At about $2^1/_3$ of the distance between the ground surface and the pebble butt, a well-marked, though not deep, groove is made. At times, this groove is complete ; others half or two-thirds. Two specimens are reproduced[211] out of the six illustrated by DANI.

The typological and distributional analysis of Assam ground stone tools by DANI[212] has shown that :

Types VI-VII (his F and G) are confined only to the Naga Hills and Upper Burma; hence these seem to be indigenous to these regions. These are also believed to be late technologically. But this point can be firmly accepted only after one or two excavations.

Type IV, the one with broad cutting edge, (or C), might have penetrated Assam from India and not South-East Asia, where it is absent.

Type V, the Splayed Axe (Type D), is comparatively rare in Assam and, as discussed above, its occurrence in India as well as in Yunnan and South-East Asia makes the question of its origin doubtful.

The Rounded Butt Axe (Type III or B) again has a problematical origin. One of its main sub-types (type b) has affinities with those of other parts of India, whereas the plano-convex variety having its major concentration in the Sadiya Frontier Zone might have an indigenous or extra-Indian origin.

205. *Ibid.*, pp. 68-69, pl. 12, 61-63.
206. *Ibid.*, pl. 13, nos. 64-65.
207. *Ibid.*, pl. 13, nos. 68-71.
208. *Ibid.*, pl. 13, nos. 66-67.
209. Here Fig. 115.
210. DANI, *op. cit.*, pl. 54 and Brown, Coggin, in *J.A.S.B.*, Vol. X, 1914,pp. 107-09.
211. Here Fig. 115.
212. DANI, *op. cit.*, pl. 16, nos. 105-110.

Then remain the two principal tool types. The Shouldered Tool (Type II or E) has two main sub-divisions (*a*) Regular and (*b*) Irregular. The former is predominant in the Cachar Hills and since this tool type is most common in Burma and is also one of the main Neolithic tool types of South-East Asia, it is argued that it came to Assam through the Cachar Hill Zone from Burma.

Lastly the Facetted tool (Type I or A) has a wide distribution in Assam (the regular variety alone appears in 5 zones) itself. Since these are found in Chinese graves of c. 1000 B.C. and are prevalent in Eastern Asia, their exclusive distribution in Eastern India proves their undoubted East-Asian origin.

DANI hence concludes that the Neolithic cultures of Assam, as represented by the two or three types of tools peculiar to the province, were derived from South-East Asia and Southern China, and hence should be (relatively) late. Their absolute date depends, first, upon some large scale excavations in Assam and secondly the date of these cultures in the above mentioned countries. Sociologically, however, it is far more important to know whether these are related with the various Naga tribes and their ancestors. This might throw light on the antiquity of the Nagas and the early (or earliest?) population in Assam and North-East Frontier.

Bengal-Bihar-Orissa Culture Complex

Geography again divides this vast area into three groups : (1) Chittagong region, south of the Khasi, Garo and Naga Hills of the Assam Culture Complex, (2) Sub-montane zone of the Himalayas, and (3) the Chota Nagpur plateau.

Sporadic discoveries of polished or ground stones have been reported from these zones, but particularly from the Chota Nagpur plateau since 1860s. In absence of any large, stratified excavation, preceded by exploration, it is not possible to indicate any chronological frame work for the type of tools, let alone their sociological significance. However, very recent work at Tamluk[213] in West Bengal, Jaugad[214] in Orissa and Sonpur[215] in Bihar gives the hope that these tools are certainly (much) earlier than 300 B.C., and that these on proper excavations will yield the much needed and sought for associated objects like pottery.

1. *The Chittagong Hill Zone*

This is culturally related to Assam complex since the few tools found here are of the facetted variety of Assam.

2. *The Sub-montane zone of the Himalayas*

Very few tools are found on the hill terraces and slopes of the higher region in Darjeeling. They are absent in the recent alluvium of the plains. The tool varieties include facetted tool types, rounded butt axe, wedge-shaped axe of Assam besides chisels and hammer stones.

213. *I.A.R.*, 1954-55, pp. 19-20.
214. *Ibid.*, 1956-57, p. 30.
215. *Ibid.*, 1959-60, p. 14; see below p. 245.

3. *The Chota Nagpur Plateau*

Of all the three zones, this is the most promising. As mentioned above,[216] it is the old land mass against which the later trough of the Himalayan rivers—the Ganges, the Jamuna and their tributaries—has been built up. Geologically it extended into West Bengal and Orissa, as well as U.P. and the Vindhya Pradesh (the former Bundelkhand and Baghekhand). Here the terraces overlooking all the eastern flowing rivers—the Ajai, Kasai, Rupnarayan, Suvernarekha and its tributaries, the Sanjai and Burhabalanga—were once the scene of a widespread Neolithic culture. For, the tools as a rule occur over high, elevated ground. These therefore were very likely the living places, incipient cultivation being carried on in the valleys proper. This is as it should be, and is in conformation with the evidence elsewhere, but needs to be established by actual excavated habitations.

Rajar Dhipi (*Fig. 115A*)

Since this was written the eastern parts of the region now falling within the Burdwan and Birbhum Districts of West Bengal have been partially surveyed by Shri P. C. Dasgupta. A number of sites have been found in the valleys of the Ajay and Kunoor and the site of Rajar Dhipi was tested by a trial excavation. The area as well as the finds have been seen by the writer. While nothing definite can be said about the date of the culture, the finds are very interesting. There is a fine very black-and-red pottery with paintings in white, a red one also occasionally painted. Among the shapes, there are bowls and dishes with small open channel-spouts (See *Fig. 74c*). These remind one of those of distant Navdatoli in Central India and of T. Narasipur in Mysore. But these should be related to those from Sonepur in Bihar.

The occurrence of iron suggests that the Rajar Dhipi Culture might not be very early ; but its location in the rich iron ore and rice-growing area is highly significant. Further exploration in the region if followed by horizontal excavation is likely to lead to the understanding of the first steps in agriculture and iron-mining in Eastern India.

Some of the south-western tributaries of the Jamuna rising in the Central Indian highlands, like the Chambal, as well as others of the eastern group like the Son and the Tons, have occasionally yielded neoliths, the most recent being a beautiful, long, ground, pointed butt axe from Rajghat[217] on the Betwa 12 miles north-west of Lalitpur in Guna District and another from Eran on the Bina. These as well as the solitary finds in Rajasthan[218] (Tambavati Nagari) suggest either that once the Peninsular Neolithic Culture had a very wide distribution encompassing even the Deccan and Malwa plateaux[219] and not confined only to the south-east, as thought by Dani[220] or that these are imports. This stone tool equipment was gradually given up after the introduction of copper, but it did not really survive in the Iron or Early Historical period, as it is

216. Above p. 23.

217. *I.A.R.*, 1959-60, p. 48.

218. Brown, Coggin, *Catalogue of Prehistoric Antiquities in the Indian Museum*, 1917, p. 189.

219. One pointed butt axe was found in 1957-58 at Navdatoli from the foot of Mound II. See *I.A.R.*, 1957-58, p. 32, fig. 20 no. 3 ; whereas previously one was found at Maheshwar on the opposite bank in the last century.

220. Dani, *op. cit.*, p. 88.

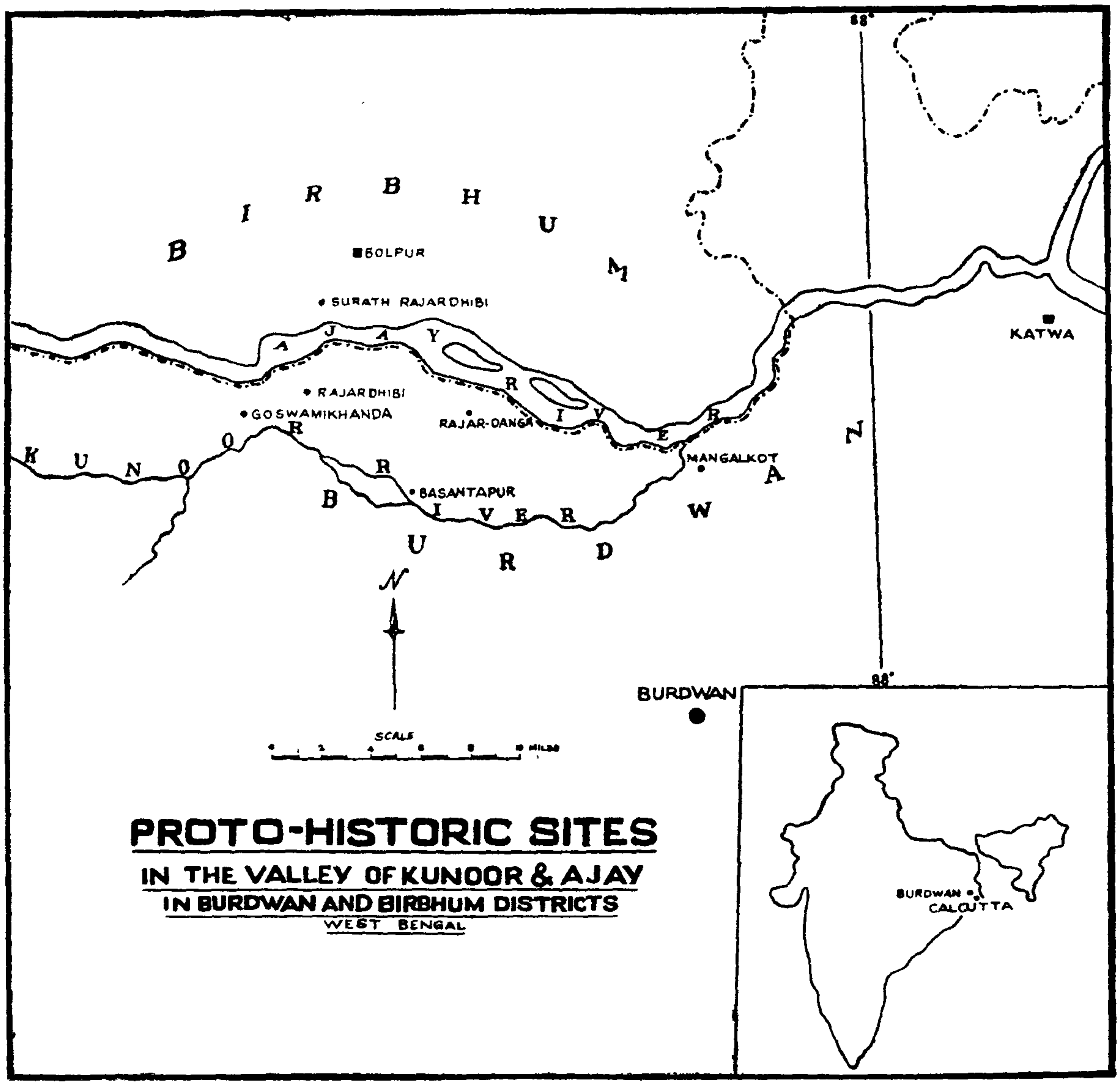


Fig. 115A

inferred by Dani and others from the stray occurrences at Taxila, Bhita, Kausambi and Bangarh in the Dinajpur District. At Nevasa both palaeoliths and polished or ground tools were found in layers of the historic period, as also huge blocks of gravel conglomerate. This only indicates that the later people brought the older debris for filling up their floors etc. and along with these came tools of three earlier Stone Ages ! But not that these people *intentionally used these stone tools in the same way as the earlier people.* Of course, in some cases the use of Neoliths or beautifully smoothed pebbles etc. as amulets or Siva lingas by the later inhabitants need not be ruled out, as instances are known of such usage today !

The Chota Nagpur material falls into two groups—(*a*) Types found under observed conditions such as those of Anderson in the valley of Sanjai below the alluvium, Sen in Sanjai Valley, and Bamal in Midnapur District, Ray in the

terraces in Bongara in Manbhum, SINHA in South Manbhum, LAL at Ban-Asuria, Jashpur, Dashphalla and Baidyapur in Orissa, MUKHERJI at Deulbarh in Midnapore District and NAGAR in Musanagar in Kanpur District,[221] (*b*) Surface collections[221a] and their study.

The typology of the neolithic tools shows the following varieties: (1) axes, (2) wedges, (3) chisels, (4) perforated tools, (5) shouldered tools (hoes) and (6) hammer stones. Three different techniques—chipping, pecking or hammering and grinding have been used either singly or in combination to produce these tools.

Round Butt Axe

The predominant tool in this culture complex found in Singhbhum and Manbhum is the rounded butt axe with median cutting edge bifacially ground and the transverse section ovoid or lenticular. This type is found in Assam, and also in Kaimur and Banda. DANI distinguishes two main types :

I Axe-blade with median cutting edge formed by bifacial grinding ;

II Axe-hammer with broad end flat or blunted. In this (former) four sub-types are further made.

Ia Axe-blade with pointed butt.[222]

Ib Axe-blade with butt thick and blunt.[223]

Ic Axe-blade with very broad cutting edge and pointed butt.[224]

Id Axe-blade with very thin section[225] (because of slaty material).

DANI makes an important observation regarding the cross-section of these axe blades. These vary widely, probably because of the great range of raw material.

DANI's another observation needs a possible correction. He says that in China the pointed butt axe as well as an adze with an unifacially ground and bevelled cutting edge and the other side flat by grinding are found together, whereas in India only the former is found ; the true adze is totally absent. This is not so. At Nevasa an adze has been unearthed from the Chalcolithic layers,[226] while, as shown below, recently others have been found at Piklihal. And two were found by the writer in the collection of Maski and other sites in the Hyderabad Government Museum. Hence WORMAN's suggestion that Indian Neolithic is indebted to China should not be set aside on this ground alone. For we (India) have both the types, though their proportions differ.

221. After this was written (25-10-1961), Shri B. K. THAPAR, Superintendent, Excavations Branch, Archaeological Survey of India, conveyed to me personally the results of his small excavation at Luchai near Baripada, former Mayurbhanj State, in the Burhabalang Valley. Here a very gritty, micaceous, hand-made pottery with a few ground axes, flakes, was found in layer I. Below, layer 2 yielded microliths which included a lunate, one broad semi-circular axe, a pointed core, besides some patinated flakes of sandstone. All this material was kindly brought to Poona for my inspection.

221*a*. For instance ALLCHIN's study of the large BODDING's collection at Cambridge. *BSOAS*, 1962, pp. 306-30.

222. DANI, *op. cit.*, p. 91-92, pl. 22, nos. 31-32, etc.

223. *Ibid.*, pl. 19, nos. 8-9.

224. *Ibid.*, p. 92 and Theobold, *P.A.S.B.*, Vol. XXI, 1862, p. 323-27. RIVETT-CARNAC, *J.A.S.B.*, Vol. LII, 1883, pp. 221-30, pl. II, 1, 3-5 and pl. XIX, 12.

225. *Ibid.*, pl. 19, nos. 5-7, and Ray, *M.I.*, Vol. XXXIV, pp. 16-19, pl. II.

226. SANKALIA and others, *Nevasa*, p. 157, Fig. 72, 6. This section is plano-convex,

Wedge-shaped Axe

A variant of the axe, probably type IC, the main difference being the pointed butt, is chipped transversely and ground, producing a flat butt. In this type, the edge is median, bifacially ground, and the cross-section is rectangular.[227]

Chisel

In this region it has generally rectangular cross-section with flat butt, cutting edge (occasionally splayed), generally bifacially ground.[228] Though a chisel with rectangular cross-section is stated to be a peculiarity of Eastern India, Nevasa also has given such a chisel,[229] and so also Maski.[230]

Perforated Stones

Circular or oval flat stones with a hole in the centre, having an hour-glass like section, worked from both faces, hardly any grinding, edges blunt. Thus in form and technique these do not differ from other Indian forms, whereas in Burma and Malaya they are ground and sawn, being influenced by Northern China.

Shouldered Celts

As in Assam, it is found at Deulbarh in Midnapore District, at Bongara in Manbhum, Dalbhum, Mayurbhanj, Central India,[231] at the mouth of Godavari, Hyderabad and Northern Mysore.[231a]

ALLCHIN's classification of tools is slightly different. While his types I, III, IIIA, IV, V, VI are not different from the corresponding types of Dani, he makes a separate category of a large group of 909 tools and calls them " small celts " with sub-varieties.

Hammerstone or Pounders

These are generally elongated pebbles hardly showing any working. RAY reports a potter's dabber from Bongara in Manbhum and outside this region, a number of grooved hammerstones are found in the Kaimur hills.

A few new types have been found from chance surface collections of BODDING, RAY and others. The ' Bar Chisel ' is one such reported by LAL at Ban Asuria, Jashpur Thakurani, Sitabhanj and Daspalla in Orissa and in the Santal Parganas in Bihar. It bears close similarity to the Malayan types with the main difference that the latter are ground.[232]

In this summary one or two observations have to be made. Firstly, that KRISHNASWAMI's view that microliths do not occur in Mayurbhunj or districts in northern Orissa has now been disproved by the explorations of Dr. G. C.

227. DANI, *op. cit.*, p. 94, pl. 20, nos. 15-16.
228. *Ibid.*, p. 94, pl. 20, nos. 18-20.
229. SANKALIA, *op. cit.*, Fig. 72, 7.
230. *Ibid.*, p. 159.
231. DANI, *op. cit.*, p. 98.
231*a*. ALLCHIN, (*op. cit.*, p. 325) has rightly pointed out that this distribution does not take into account the very sporadic character of the finds at Chitor (Nagari), Kausambi, Godavari valley and Bihar, and affirms that this tool type really belongs to Assam and South-East Asia.
232. KRISHNASWAMI, *op. cit.*, p. 142-43.

MOHAPATRA,[233] Smt. MITRA,[234] and the recent small dig of Shri B. K. THAPAR near Baripada. Secondly, there does not seem to be any connection between the copper slag heaps or the occurrence of metals in their raw form with the microliths. Whatever microliths have been collected and observed belong to the true microlithic stage. They should be of the Mesolithic period or later. They are essentially different from the blade culture of the Chalcolithic period. It is not suggested that there was no true Chalcolithic stage of man's development in this area.[235] But unless some such things are found in closely observed conditions, the surface microliths should not be connected with the Chalcolithic stage. A few microliths from the Tripuri Excavations[236] seem to belong not to the Chalcolithic stage, but to an earlier stage, and therefore they cannot be taken as suggesting a link between Western India and Chota Nagpur plateau, as suggested by KRISHNASWAMI. In fact, the Birbhanpur microliths and all others from the geological context seem to belong to a Mesolithic or to a late Mesolithic stage in Eastern India. It is interesting to note that a chisel with a square section with two of its surfaces ground and a bevelled edge was found in the historic layers in the earlier excavations at Nevasa, whereas the chisels from Piklihal have also similar section. The former may have an importance, or nothing if it was merely an import from the east. But if it was not and if many more finds of such a nature are found from the south and the Deccan, then regular contact between the east and the south may be postulated.

Origin

It has been argued by DANI that the Eastern Neolithic in many aspects can be derived from the Far East. Siam need not be discussed, because so far not much work has been done in this country. So also Malaya, except that the Cave Culture of Kelantan has given a highly polished black pottery, which may have influenced the later megalithic pottery of South India or and also of Burzahom in Kashmir. But unless such pottery or its analogues are found in the excavations in Eastern India, this analogy need not be emphasied. However, Indo-China is important, because the evidence has been obtained from excavations in cave shelters and kitchen refuse. The evidence has been grouped into three cultural divisions after three chief sites: Hoabinh and Bacson to the south-west and north of Hanoi and Somrong Sen in Cambodia viz. 'Hoabinhian, Bacsonian, and Somrong Sen with a typological evolution from merely chipped and slightly smoothed stone tools found at the base of the deposits to well-shaped, finely-smoothed stone artifacts at the top. Pottery occurs only at the upper levels with the more advanced tool-types like the shouldered tool (hoe) and facetted tools exhibiting a sawing technique. Hoabinhian and Bacsonian have three divisions which can be equated to one another. The Somrong Sen kitchen-midden culture of Cambodia and Annam is contemporary with the final Bacsonian and Hoabinhian stages and the types are most varied and highly developed ground tools. Along with the types of the two earlier phases, the following types are very characteristic—the shouldered tool (hoe), the axe and the facetted tools with unifacial and bifacial ground edge, adze with bevelled cutting edge, chisels and gouges. Iron and bronze implements are also associated. Pottery is handmade with sophisticated designs ".[237]

233-34. MOHAPATRA, *op. cit.*, p. 121 and above p. 143.

235. For Sonpur in Gaya District might be Chalcolithic.

236. DIKSHIT, M. G., *Tripuri—1952*, 1955, p. 118, fig. 43.

237. KRISHNASWAMI, *op. cit.*, p. 144, and DANI, *op. cit.*, pp. 108-09 ; 127, 140, 147, 149.

In the Far East, particularly Indo-China, two cultural traditions seem to be in evidence according to the types of tools and stratigraphy. In the earlier the tools are marked by chipping and flaking and a little grinding along the edge. Later, however, in the top-most layers, the tools are not only well-polished, but a new technique called "sawing" by some metallic wire seems to have been employed.

In the absence of stratigraphical evidence from Eastern India, it is impossible to say when these two traditions entered India. But judging from the tool types, which have got widespread distribution in the Far East as well as in Eastern India, viz. (1) shouldered tool or hoe, (2) round butted axe, and (3) chisel with a triangular section, it would undoubtedly appear that they have been derived from the Far East. It has been suggested by DANI that the shouldered celt etc. belong to a later phase.

Metal Prototypes

Another interesting feature is that some of these forms are found in the copper hoards from the Gangetic Valley and in the hoard from Khurdi, Parbatsar tehsil, Nagaur District, now in Sardar Museum at Jodhpur and in the axes found in Phase I of the excavations at Navdatoli. Until the discovery of the last, one might have postulated copying in metal of forms occurring in stone. But the date of Navdatoli shouldered copper axe would be at least 17,00 B.C. if not very much more. Hence we have to assign an earlier date to the stone types of Eastern India. This is not possible in our present knowledge. Hence, the other alternative namely that certain forms—particularly the splayed axe with a broad cutting edge, and even the bar celt - as also the shouldered tool believed to be a copy in stone from a bronze original found in a grave at Anyang and dated to the Yin dynasty[238] (1300-1028 B.C.)—are copies of metal prototypes seems most likely. One more interesting feature was brought to light very recently and that is the association of a black-and-red ware at Sonpur[239] and other sites in Bihar and Bankura and Burdwan Districts of West Bengal. This goes to the earliest period in some of these sites, which being pre-N.B.P. should be about 600-700 B.C. at the latest. Now the question has arisen whether this black-and-red ware also comes from the east or it comes from the west, where it has been found in association with Harappan Culture.

The occurrence of grooved hammerstone is extremely rare in the Far East. But it should be mentioned that this has been found in 1959-60 in the excavations at Burzahom near Srinagar in Kashmir in a purely Neolithic context. Surface finds have been reported by FOOTE and others from South East India. Whence did this tool type go there? In our present knowledge the movement seems to be from the south along the coast.

Perforated Hammerstones

Perforated hammerstones which have been regarded by some people as mace-heads and by others as weights for digging sticks have been mentioned by FOOTE and also occurred in excavations in Zone II from the bottom at Langhnaj in Northern Gujarat and in the excavations at Nevasa and Navdatoli in a

238. DANI, *op. cit.*, p. 226.

239. *I.A.R.*, 1959-60, p. 14 and 1960-61, p. 4.

Chalcolithic context. Do these suggest again the survival from a purely Neolithic stage in Eastern India and Gujarat? Their exact function has not been determined either in the East or in South-East India.

It would thus appear that influences from the east as well as from the west seem to have been at work in Eastern India. Until large scale excavations are carried out in at least two or three sites, no clear picture of the Eastern Neolithic culture can be presented. Even it may be doubted whether the tools so far found are sporadic, indicating a few imports and not a cultural stage in this part of India.

However, THAPAR's very small dig at Kutchai, mentioned above, shows that polished axes are associated with pottery and both might be of some antiquity.

In this summary of the Eastern Neolithic, one does not know where to place the recent finds from Sonpur[240] in Gaya District and those from Rajar Dhipi, Burdwan. Out of the three periods, Period IA and IB yielded coarse and fine black-and-red pottery respectively. Both are said to be entirely wheel-made. The former included hemispherical bowls, and vases in black-and-red wares. In the latter, IB, also occurred lipped bowl, perforated bowl, dish and vase. Interesting was the discovery of a few post-cremation burials. Among other discoveries may be mentioned terracotta and bone heads and arrow-heads of bone.

That this complex is pre-NBP is definite, but does it go back to a Neolithic period, about 2000 B.C. or is it a late phase of the Chalcolithic? For the former view we may cite the lipped bowl and perforated pot from Piklihal (to be discussed in detail below), though no ground tools are so found. For the latter a slow diffusion from Western India.

South-East India (*Fig. 117*)

This region which stretches from the border of Chota Nagpur and Orissa to the tip of the peninsula comprises the oldest rock formations leaving out the eastern coastal strip and the Deccan lavas in Maharashtra on the west. Westwards, this zone is composed of the granites and gneiss, whereas the Nallamalais and Erramalais are predominantly made up of the quartzites, schists, sandstones and limestones. Physiography thus differs and changes abruptly as we proceed from the west to the east and south-east. The open country or the Maidan on the Mysore side, consists in general of rolling plateaus rising in the east into disjointed granitic hills of irregular plan and height and interpersed with blackish soil, which with irrigation yields rice, bananas, coconut and sugar-cane. Further eastwards the region traversed by the Bhima and the Godavari, the Krishna and the Tungabhadra, the last two forming the Raichur Doab, is again an open country with a difference. Groups of bare granite hills, and innumerable fantastic *tors* (boulders) litter the plains with reddish sandy soil which supports a thorny scrub vegetation. The rivers are mere trickles. While this is true of much of Telangana, the country enclosed by the Erramalais and Nallamalais is in a sense worse. However, there are a number of longitudinal river valleys

240. *I.A.R.*, 1959-60, p. 14 and fig. 6, 1960-61, p. 4.

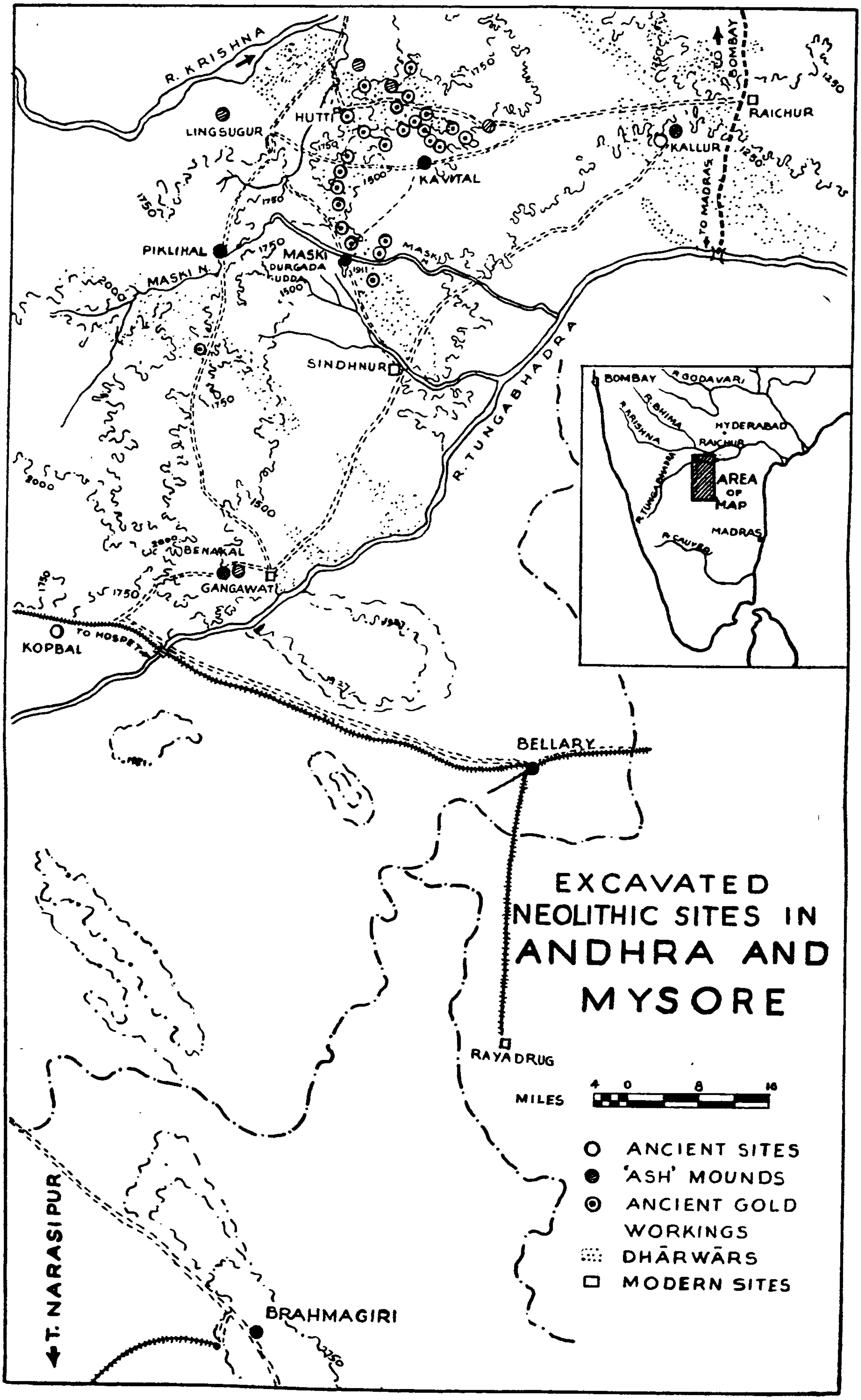


Fig. 117. Excavated Neolithic Sites in Andhra and Mysore

which favour bunding and construction of large tanks. This alone makes it possible to have two rice-crops a year, and the cultivation of jowar and groundnut.

The details about physiography and food crops have been mentioned once again because they (might) have had some bearing on the origin and spread of the Neolithic culture of South-East India.

The granite hills—rocks and rockshelters—have open spaces within them, at a considerable height above the plain. Thus they afford natural protection to beasts and men. ROBERT BRUCE FOOTE was particularly struck by these physiographical features which one notices while passing through border districts of Raichur, Bellary, Chitaldurg and Anantapur of the present States of Andhra and Karnatak. His favourite terms for these were "castellated" hills and "linchets," that is "terraces." And he rightly inferred that they were inhabited during the Neolithic times.

The above mentioned districts, particularly Raichur and Bellary, were probably the original focus of the Neolithic cultures in South-east India, as here the living conditions were ideal and raw material available in plenty in the basalt and diorite dykes. From here the culture might have overflowed eastwards and westwards, in the adjoining distritcs of Guntur, Nellore and Cuddapah and further south in North Arcot, Chingleput, Salem and Madura[241] and westwards into Mysore (Bangalore, Mysore), Bijapur, (Dharwar) and Maharashtra (Ahmadnagar, Poona, Khandesh),[242] where recently ground or polished stone tools are being found in increasing quantity and at a number of sites. However, it must be emphasized that the number decreases as we go further away from the Raichur Doab and Bellary. A recent survey of the Kurnool District yielded no ground tools between the Erramalais and Nallamalais. This is probably due to the dearth of suitable raw material and sheltered habitations. But it is not completely bereft of Neolithic remains. FOOTE mentions a few sites of which the site of Patpad or Patpadu in the former state of Banganpalle is the most important. It had given FOOTE[243] a unique "milk bowl," which according to recent evidence (to be discussed later) from Nagarjunakonda and Piklihal (and the distant Navdatoli) could belong to the Neolithic period.[243a]

Thus within this vast area we may distinguish between (*a*) original home of the Neolithic Culture and (*b*) its dispersal.

Discoveries in both these, particularly in the first, have been made since 1842, some of the most famous names being MEADOWS TAYLOR, Captain NEWBOLD, ROBERT BRUCE FOOTE, LEONARD MUNN, KHWAZA MOHAMMED AHMED (who excavated at Maski).[244] Still, very little systematic work has been done with a view to knowing the life and times of the Neolithic people. Vast collections of surface tools were stored in Bombay, Calcutta, Hyderabad, Madras,

241. See, for a list of sites noted up to 1947 *A.I.*, No. 4, 1947, pp. 295-98. Surprisingly it omits sites in Kurnool, Cuddapah and Bijapur Districts mentioned by FOOTE.

242. See, SANKALIA and others, *Nevasa*, p. 503 and map facing page 494.

243. FOOTE, *op. cit.*, p. 115.

243*a*. This is also the view of Dr. F. R. ALLCHIN. See *Antiquity*, Vol. XXXVI (1962), p. 221.

244. *J.B.B.R.A.S.*, IV, 1852; and FOOTE, *op. cit*; MUNN, L., *Man in India*, 1935, pp. 225-50; *Annual Report, Hyderabad Archaeological Department*, 1935-36, Appendix D.

London and Cambridge and a few exhibited. Attention on the problem had been drawn by the late Rao Bahadur DIKSHIT[245] and the Deccan College, by choosing Bellary for a beginning. Later, WHEELER dug at Brahmagiri, and SUBBARAO at Sangankallu. Thus the Neolithic Cultures of the region came to be placed in some perspective. This has been further clarified by ALLCHIN's work at Piklihal, SESHADRI's at T. Narasipur and the Department of Archaeology's excavation at Nagarjunakonda. Mention must also be made of ALLCHIN's studies of the collections in London.

All this enables us to draw a rough picture, in bare outline, of the Neolithic way of life in Andhra-Karnatak and its likely affinities with those of Maharashtra and elsewhere.

Small but careful excavations at Sangankallu[246] and Piklihal[247] have confirmed the repeated observation of BRUCE FOOTE that the granitoid hills and rock-shelters in the Raichur Doab and the adjoining Bellary were inhabited by man during the Neolithic period. But occupation was not confined only to the safe enclosed areas within the hills. Excavations at Maski[248] and Brahmagiri[249] have shown that even the sloping ground along the foot of these hills was occupied. At the latter site, a town grew up in the Megalithic and Mauryan period.

Maski and Piklihal are close to each other, the former on the Maski river, the latter near to it and on the ancient highways in the Raichur District. Maski had the unique distinction of bearing not only the Asokan edicts, but containing the name of the emperor as well. This it now shares with another at Gujarra. Piklihal is believed by ALLCHIN[250] to be the ancient site of Modogoulla mentioned by Ptolemy, but now preserved in the famous mediaeval fort of Mudgal.

Brahmagiri was no less important, being perhaps the ancient town site of Isila on the south-western frontier of Asokan empire and also honoured by three copies of his Minor Edict No. 1. Bellary itself cannot claim any of these advantages though Koppal (spelt also Kuppal, Kupgal) nearby has another Asokan edict. Thus anciently, some 2300 years ago, all these sites on the Andhra-Karnatak border were of no little historical importance. However, these sites which have identical physiographical features, had attained a kind of cultural unity some 2000 years earlier.

Before going into details, it may be said at the outset that from the nature of the evidence tendered by Piklihal, Bellary, Brahmagiri and Maski, it appears that the following chronological relationship may be postulated. (*Fig. 118*)

Brahmagiri IA = Bellary (Sangankallu IA) = Piklihal IA or Lower Neolithic

Brahmagiri IB = Sangankallu IB = Piklihal IB = Maski I or Upper Neolithic

245. *Proceedings of Twenty-Seventh Indian Science Congress, Presidential Address, Anthropology-Archaeology Section*, 1940, p. 317.

246. SUBBARAO, BENDAPUDI, *Stone Age Cultures of Bellary*, Poona, 1948, p. 5.

247. ALLCHIN, F. R., "Piklihal Excavations," *Andhra Pradesh Government Archaeological Series*, No. 1, Hyderabad, 1960.

248. THAPAR, B. K., "Maski 1954," *A.I.*, No. 13, 1957, p. 10.

249. WHEELER, R. E. M., in "Brahmagiri and Chandravalli 1947," in *A.I.*, No. 4, p. 222.

250. *Op. cit.*, p. 3.

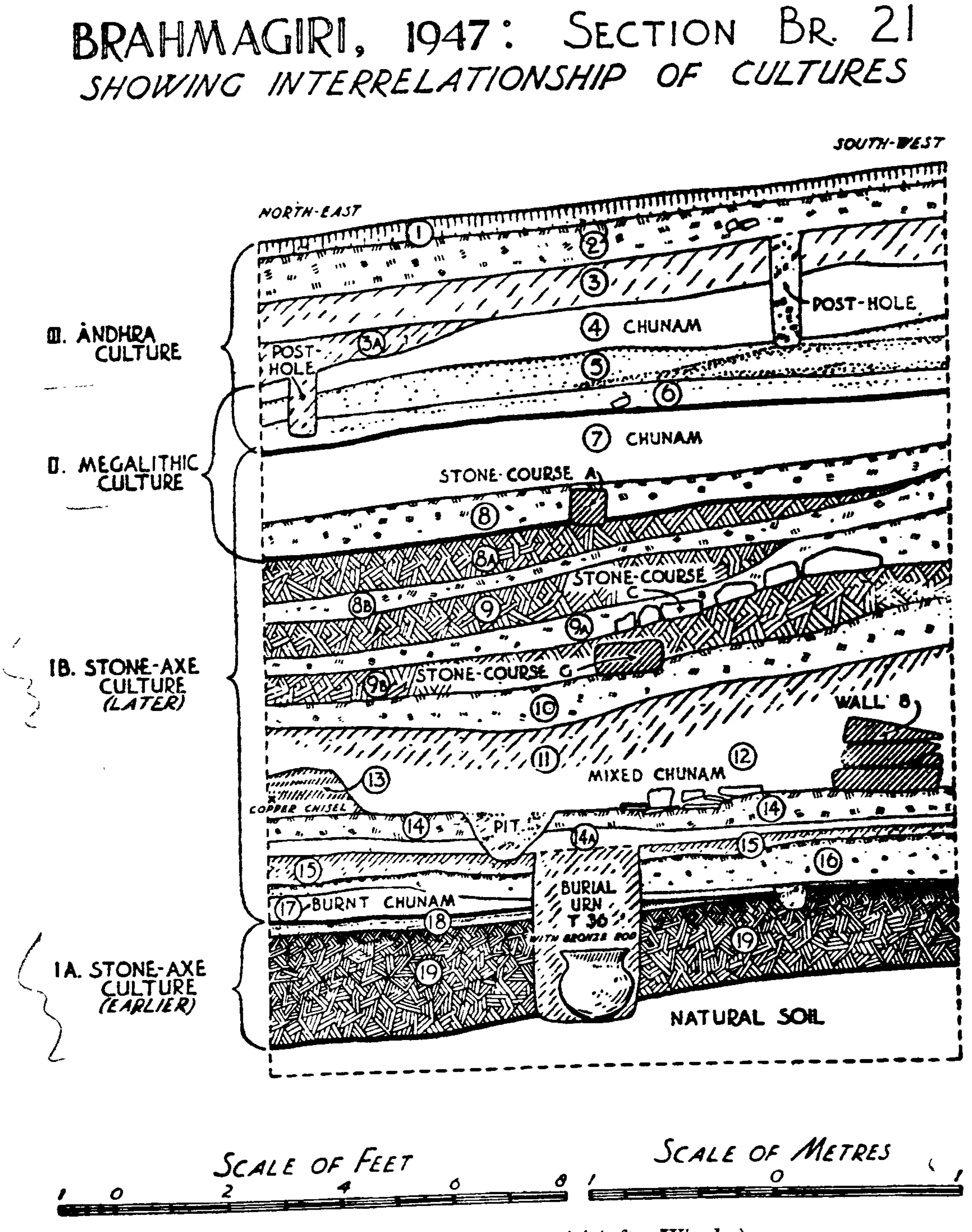


Fig. 118. Section at Brahmagiri (*after Wheeler*).

The story seems to start at Piklihal (though it is not to be thought, as it is very common, *that it was the first site to be occupied by man.* It is due to the chance of excavation) and is repeated at Sangankallu, T. Narasipur, Brahmagiri and Maski.

Around 2,000 B.C., a pastoral-cum-agricultural people had settled in this open, savannah-like region dotted with numerous granite hills. They preferred to live in and around the hills and rocks overlooking the plains. The climate at that time was dry, but perhaps the region received a little more rain and that too more regularly than at present. And so the hills were comparatively thickly wooded.

No clear picture of their house plans can be had, as at all the sites mentioned above, the excavations were of a very limited nature. But there is evidence that the huts were raised on round wooden posts—of which remains have been exposed at Brahmagiri, Maski and Piklihal. The latter site further shows that the square or rectangular exteriors were enclosed with a bamboo matting, which was covered with mud, and the floors were plastered with clay and dung, and perhaps also or alternatively with lime, lumps of which were found in Layer 8 of site VI.[251] These were repeatedly raised or repaired. Sometimes the alignment of the hut was changed. These earliest huts or simple floors might have been made just in front of the sloping surface of a rock or cave.[252]

Their main economy of life was tending cows/bulls, goats/sheep, and probably buffaloes, and carrying on a primitive kind of agriculture. So far no grains or their impressions have been found, but the existence of large concave-shaped saddle querns and several rubbers or pounders suggest that some kind of grain was available which was coarsely crushed and eaten. This is also inferred from the worn out teeth of two intact skeletons and a human jaw.

This settled way of life is also indicated by a variety of vessels and tools and weapons (?) of stone.

The vessels—pottery at Piklihal, Sangankallu and Brahmagiri—were all hand-made, or as ALLCHIN has said by a careful study and observation, a part of it was made on turn-table—often a simple lower half of round-bottomed pot and turned with hand as and when necessary.

Technologically some five varieties are distinguished at Piklihal,[253] three or four at Sangankallu,[254] three at Brahmagiri,[255] and likewise at Maski.[256] At the last mentioned site wheel-made pottery seemed to be in a majority and on the whole it is to be regarded as a later development, though conforming to the main grey, black and buff fabrics at all the sites under discussion.

251. ALLCHIN, *op. cit.*, p. 22. At Brahmagiri, it is said to be a characteristic feature of site Br. 17 and is clearly visible in the illustration (pl. CII).

252. *Ibid.*, p. 23.

253. ALLCHIN, *op. cit.*, p. xv.

254. SUBBARAO, *op. cit.*, p. 13.

255. *A.I.*, No. 4, p. 222.

256. *A.I.*, No. 13, p. 12-13 and 40.

The Piklihal collection of pottery forms and fabrics seems to be fairly comprehensive. It is therefore discussed and illustrated here, citing wherever necessary types from adjoining sites. On the basis of technique, colour, slip, dressing, nature of the clay, method used in shaping and decorating, ALLCHIN[257] has given us five groups of his pottery.

A1 having, grey, black, and buff fabric with *unburnished* surfaces. This also includes (*a*) a small percentage of incised and (*b*) perforated wares, and (*c*) rusticated (roughened) surface (the last belongs to a later phase, called Upper Neolithic).

A2 Similar as above in colour, but having *burnished* surfaces, which have a red ochre wash after firing.[258] Briefly ochre painted and burnished.

A3 This group has red, black, chocolate or brown ochre surface, owing to a distinctive slip or dressing.

A sub-group of this (*a*) is painted in purple ochre before firing.[259]

A4 having grey, buff, mottled colours, burnished, fused surface, and probably made on a turn-table.

A5 Grey, buff, olive green, burnished surfaces, approaching the black-and-red ware (or red-and-black), and probably made on a turn-table.

Of these, A3 is purely Lower Neolithic, A4 and A5 Upper Neolithic, so also the rusticated ware and A1-A2 belong to both the phases.

It may be mentioned that both SUBBARAO[260] and WHEELER have similarly postulated two phases, the former on the basis of differences of pottery fabrics, the latter on the evidence of a stratigraphic break (weathered layer),[261] which is also supported by the differences in pottery. As at Piklihal, a few painted sherds occurred in layer 19 of Br. 21.

At all the four sites it was observed that the clay used for pottery making contained sand and mica, both probably due to the granitic-gneissic rocks. This had some effect on the baking of the pots. Pottery having high mica-content is not well baked, and flakes off into layers. However, this feature is absent in A4 and A5 wares of the Upper Neolithic, which are on the contrary gritty. While a fairly good percentage of the pots have smooth surfaces, some inside as well as outside, owing to burnishing, a few are painted, some before and some after firing. In the latter case, the paint naturally rubs off on the slightest touch and more so, when the pottery is washed.

The range of forms is in a sense amazing, particularly when compared to what previously was known from Brahmagiri, Maski and Sangankallu, though the last was admittedly only a small dig.

257. *Op. cit.*, p. xv.

258. This fabric and some of its forms compare well with those of Jorwe-Nevasa, indicating a common substratum.

259. Probably this may be similar to the Jorwe-Nevasa painted matt ware.

260. *Op. cit.*, p. 9.

261. *Op. cit.*, p. 204 (Site Br. 21, layer 18).

There are (*See Fig. 119-20*):

1. Shallow dishes or platters with outgoing side (T1-T3, in A1 and A2 wares).[262]
2. Bowls of various sizes and shapes—(*a*) Semi-circular, (*b*) with incurved sides, (*c*) with outgoing sides and flat bottom (T2-T13). in A1-A2 and a few in A4-A5 wares.[263]
3. Lipped bowls (T14)[264]
4. Lugged bowls (T15)[265]
5. Spouted bowls (T24).[266]
6. Channel-spouted bowl (T51).[267]
7. Carinated bowls (T51).
8. Hollow-footed bowls (T65, 66, 67, 69).
9. Handled pots (T23 in A3 ware).
10. Jars with (*a*) narrow, (*b*) wide, (*c*) broad and (*d*) open mouths. (T25, 26, 16-18, 34, 36-37, 19, 20, 21, 52).
11. Bell-shaped jars (T 38).
12. Legged stands (T 58).
13. Perforated pots.

The ordinary dishes and bowls would be normally used for eating and drinking, the former even as lids, the various types of pots called jars for storing and bringing water (particularly the narrow necked), for cooking and storing. There is nothing very much new about these types ; these only help us in tracing the antiquity of some of our *thālis* (dishes), lids, *vāṭis* or *kāṭorās* (bowls), *ghaṭa* (water vessel) and possibly a few cooking vessels. Almost all these shapes appear at Brahmagiri, where the wide-mouthed jars, with flaring rim were used as urns for burying small children.

However, striking are the lipped, spouted and channel-spouted bowls, the handled pots, bell-shaped jars, the legged stands and perforated pots. Not only these suggest some special function—religious or ceremonial usage, a particular food preparation,—but also culture contacts. Almost all these are rare or absent in the historical period, but characterize the prehistoric cultures of Western Asia, particularly Iran. Thus its occurrence at Piklihal is indeed important and gives an added significance to the Patpad[268] " milk-bowl " of BRUCE FOOTE. It now poses a problem. Does this and the allied specialized shapes belong to a much wider cultural movement and if so, what way was the movement ? Or were there several movements or independent inventions ?

262. ALLCHIN, *op. cit.*, pl. 24 and pl. 28.
263. *Ibid.*, pl. 24, 25.
264. *Ibid.*, pl. 25.
265. *Ibid.*
266. *Ibid.*
267. *Ibid.*, pl. 31.
268. SUBBARAO, *op. cit.*, p. 18, f.n. 11, had noted this find and compared with a lip-spouted vessel from Sangankallu.

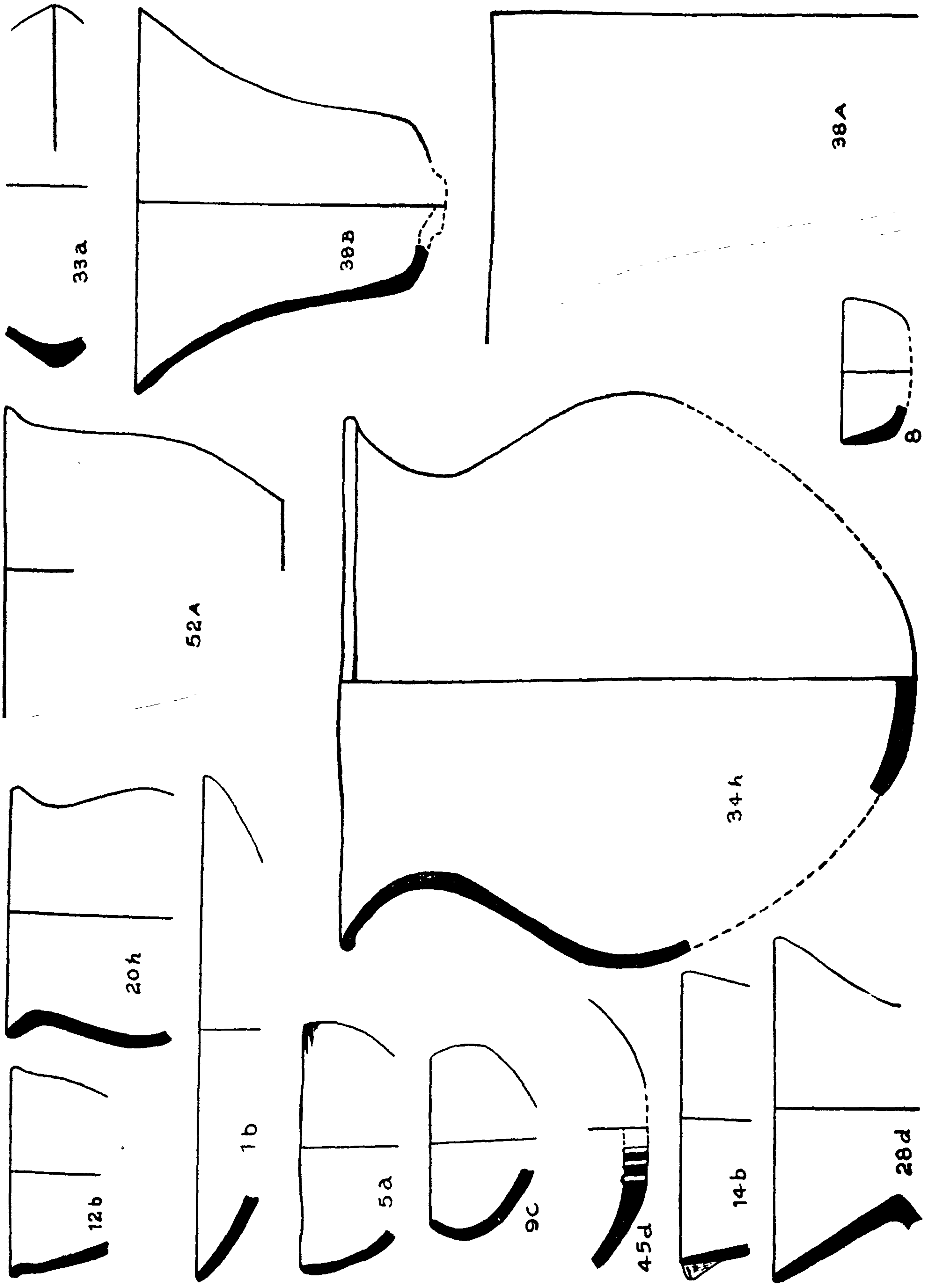


Fig. 119. Pottery types from Piklihal, Andhra.

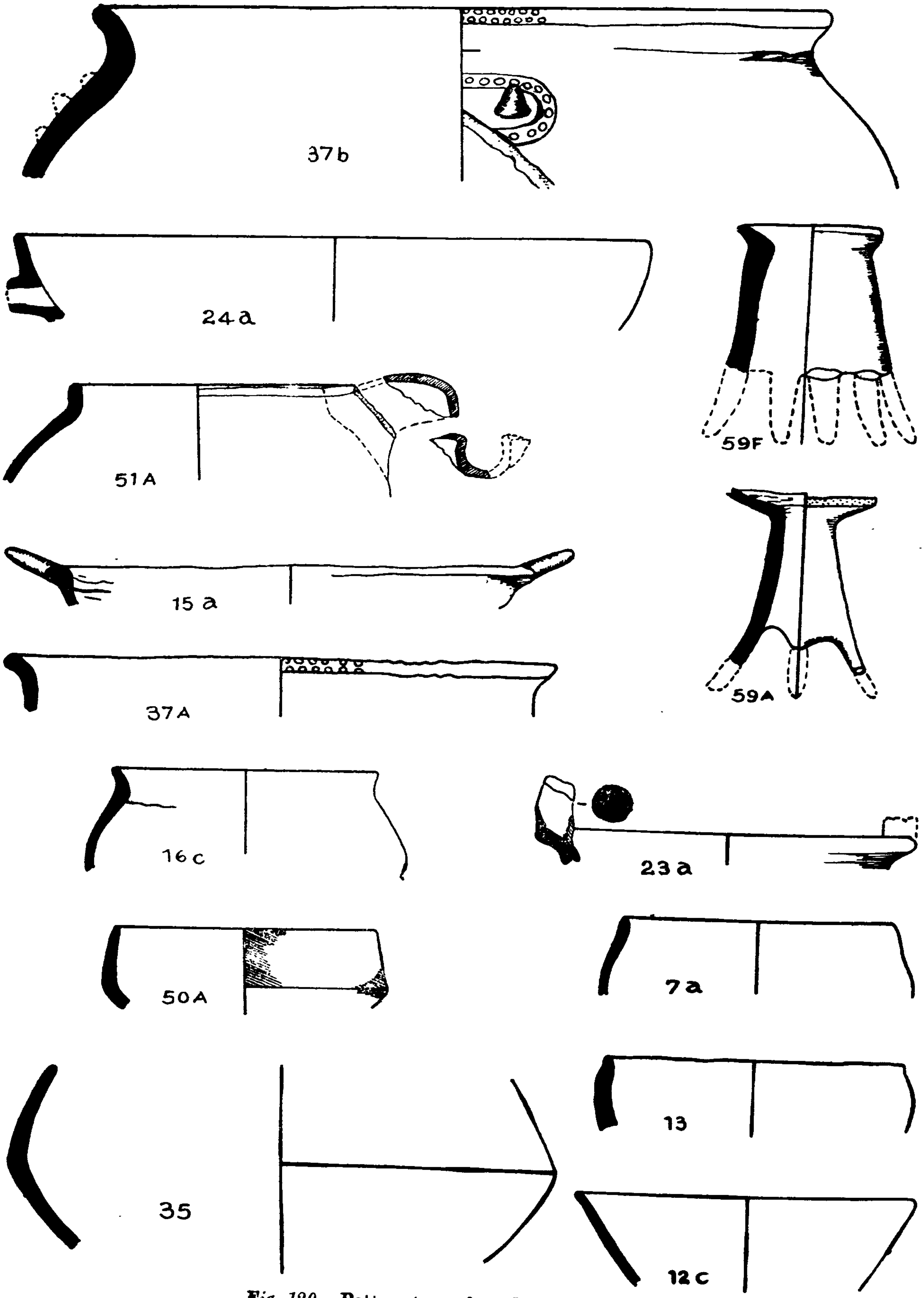


Fig. 120. Pottery types from Piklihal, Andhra.

Cups or bowls with ringed or footed base were also very much in a minority, the latter again rare or absent in the early historical period. So the occurrence of both these types at Piklihal and of the former at Brahmagiri provides food for considerable thought, as hitherto Rangpur III and Navdatoli were the only sites which had yielded such goblets or footed-cups. Outside India, they form a normal feature in Western Asiatic Neolithic and Chalcolithic cultures.

Amongst these rare types, the high multi-legged stand is unique, though it is possible that what are regarded as "lugs"[268a] are legs. If so these can be matched with one found recently at Chandoli,[269] near Poona, and those from far off Tepe Giyan[270] and China.[271]

Spouted vessels (*Fig. 121*) were first reported from Brahmagiri IA Culture,[272] then from Nasik, Jorwe[273] and numerous sites in Maharashtra; later from Nagarjunakonda[274] and T. Narasipur.[275] So also the channel-spouted bowl. When first found at Navdatoli[276] in 1952-53, it seemed to be unique. Later, a few specimens have appeared at Daimabad[277] and Chandoli,[278] near Poona, and T. Narasipur,[279] whereas its occurrence at Brahmagiri, though mentioned by ALLCHIN,[280] cannot be accepted in full, for the two illustrations (T. 77-78) are of lipped spouts.[281]

No complete, three or five legged vessel was found at Piklihal. But ALLCHIN's reconstructions seem to be authentic.

So far nothing like this has been found anywhere in the Deccan-Karnatak or outside, but one has to be on the lookout either for the legs or the bowl with broken remnants. For both—these as well as the goblets—break most easily at the junction of the leg and the base of the bowl.

Lastly the perforated vessels. No complete examples are available (elsewhere too—at Nevasa and Chandoli), but the sherds seem to belong to the base. If the sides had no perforations, then the vessel might be like the present day "*chālanī*," which is nothing but a plate or dish with broad base having perforations. The sides are straight or nearly so, and about 2 in. in height. This *chālanī* is used for straining liquids (mango juice, soups) as well as for preparing steamed bread (*Ḍhokalā*) and the like.

268*a*. See Sankalia in *Artibus Asiae* 1962-63.
269. *Ibid.*, pl. 33, 61*a*.
270. CONTENAU and GHIRSHMAN, *Excavations at Tepe Giyan*, pl. XII. and pl. 25.
271. SCHAEFFER, *Stratigraphiae Comparee*, figs. 321-24.
272. *A.I.*, No. 4, pp. 226-31 (T. 34, T. 35, T. 46 and T.76).
273. SANKALIA and DEO, *Excavations at Nasik and Jorwe*, pl. ix and p. xxxiv.
274. *I.A.R.*, 1957-58, p. 6, fig. 3.
275. There is no clear reference to a tubular spout. *I.A.R.*, 1958-59, p. 32.
276. SANKALIA, in *Antiquity*, June 1955, p. 112,
277. *I.A.R.*, 1958-59, pl. XXIII, B, 5.
278. *Ibid.*, 1960-61, p. 27.
279. *Ibid.*, 1958-59, p. 33.
280. ALLCHIN, *op. cit.*
281. *I.A.*, No. 4, fig. 23,

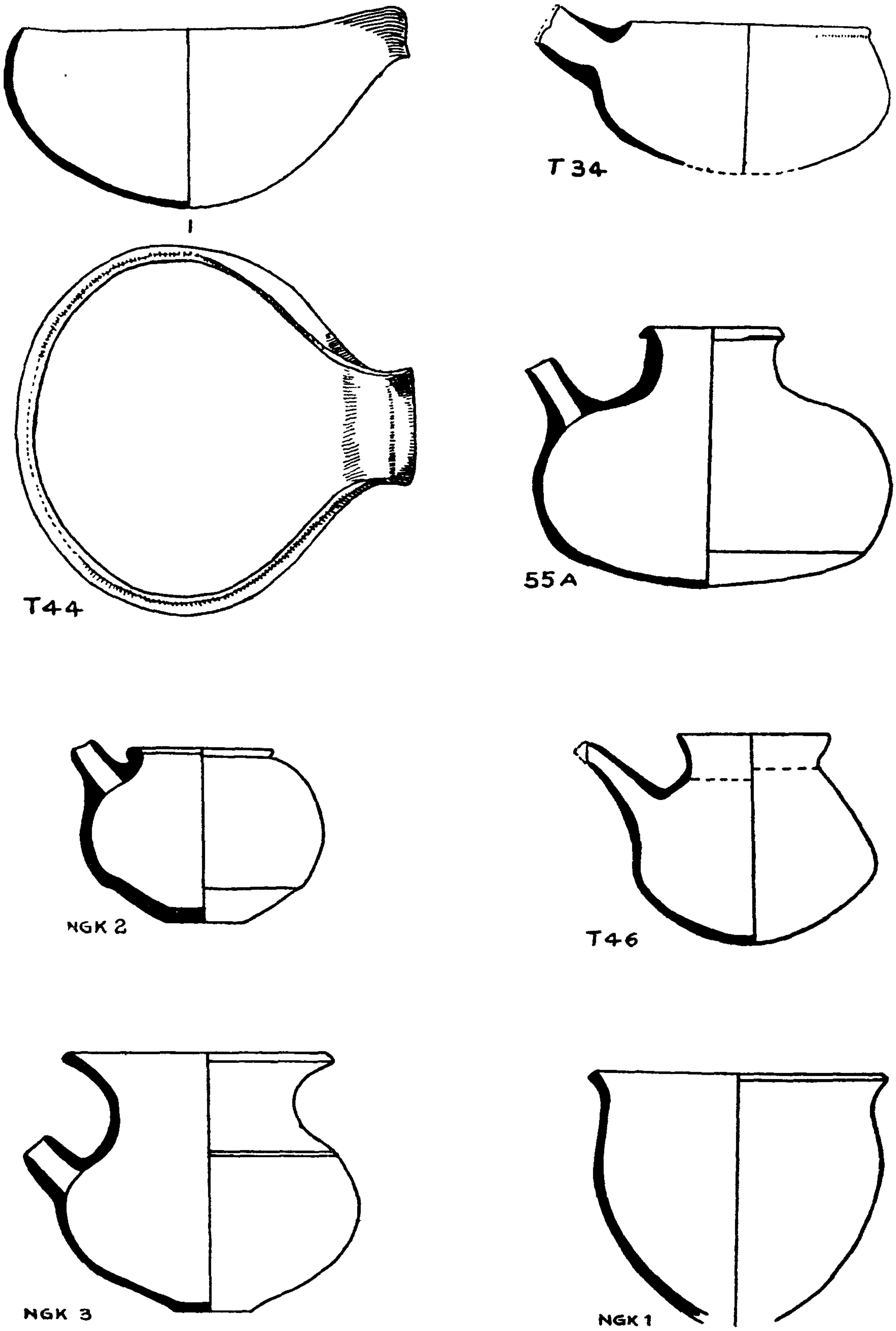


Fig. 121. Pottery types from Piklihal, Brahmagiri and Nagarjunakonda.

Ground Stone Industry

The next most important, or the most important, objects are the various types of stone tools. These have been grouped under various heads, primarily on the basis of the functions, and secondarily on the form of the object. Thus ALLCHIN classifies his Piklihal collection after his classification[282] of the English museum collections into :

I Edge-Tools
II Points (or better, Pointed tools)
III Rubbers and Grinders
IV Hammers
V Bored Mace-heads etc.

Though ALLCHIN's observations are based only on the Bellary and Piklihal collections, one may say that the various groups and sub-groups are fairly exhaustive and are true of the whole of South-East India, wherever tools of this period occur in numbers, as a comparison with Brahmagiri and other collections referred to by FOOTE indicates. Future studies, no doubt, will add a few more sub-types.

Edge-Tools

The edge-tools are those in which there is evidence of the preparation of a cutting edge either by grinding or flaking. Judged by this definition, the group comprises : (*a*) various types of Axes or Celts, (*b*) Adzes, (*c*) Chopping tools, (*d*) Wedges, (*e*) Scrapers, (*f*) used flakes.

Axes

Of these six sub-groups,—the first axes—are the most important. Usually, it is these which catch the eye of the collector. Probably, looking to its numbers and sub-types, this seems to be the most common tool in Neolithic man's tool bag. It so much varies in size—length and thickness—as well as in the form of the edge and the butt as well as in the technique employed in finishing it that we have not one but at least three criteria in classifying the sub-groups. The earliest classification in India is that of FOOTE.[283] Taking into consideration the form of—

(*i*) the butt, he had two varieties—
(*a*) Pointed butt and (*b*) Blunt butt ; that

(*ii*) of the edge, four varieties :
(*a*) Oval edges, (*b*) Narrow edges and cylindrical body, (*c*) Square edges, (*d*) Curved or convex edges ; that

(*iii*) of the sides, three varieties :
(*a*) Round sides, (*b*) Bevelled sides, (*c*) Square sides ; that

(*iv*) of the thickness or thickness of the body, two varieties : and lastly the axe with a shoulder, which is generally absent from this region. Thus we have 12 sub-types of which 11 are found in this region.

282. ALLCHIN, F. R., "The Neolithic Stone Industry of the North Karnatak Region" in *BSOAS*, Vol. XIX, 1957, p. 327.

283. FOOTE, *op. cit.*, p. 21.

ALLCHIN has introduced what he calls "technological" considerations,[284] such as—

(a) axes with edge ground and body pecked all over,

(b) axes with fully ground body,

(c) axes made from flat tabular blocks, and some having natural joint planes.

This is no doubt a desirable criterion for judging a collection and in understanding the technique used in manufacturing the neolithic axe, still for a general knowledge of the axe types prevalent in any region, it is unnecessary. For it will make the classification unwieldy. We would, therefore, endorse the current practice of grouping an axe according to its cross-section.

An attempt has been made to illustrate each of these types, besides the well-documented examples of the normal types.

Fig. 122

This illustrates the two main types of pointed butt ground axes, and an adze. According to the nature of the cross section, whether it is lenticular or ovoid, the axes have been further classified into sub-types.

Fig. 123

This figure illustrates some of the characteristic tool types of the ground or polished axe industry from Sangankallu, Bellary.

1-2	Plano-convex axe, also called a shoe-last celt, fully ground or polished on both surfaces.
3-5	Axe, partly ground on the edge and one surface, with squarish butt.
6-7	Rather large, square, blunt butted axe, with ground convex edge. Possibly used with a chisel as even now the stone knappers—who are all from Karnatak, Andhra—use a large flat bottomed axe, and with slightly tapering rounded butt and hafted in a wooden handle.
8-9	Fabricators or light hammer stones.
10-16	Chisels, with pointed or tapering butt and ground, bevelled edge.

So far nowhere either at Brahmagiri, Sangankallu or Piklihal any typological evolution in the axe type has been witnessed, though at all the three sites, as mentioned above, the Neolithic Culture is stratigraphically and/or on the basis of pottery, divisible into two (a) Lower and (b) Upper Neolithic. At Sangankallu, however, occurred highly patinated Levallois-like flakes of basalt and sandstone underlying a barren layer, below the main Neolithic deposit. Owing to the very limited nature of the dig, their exact significance as yet remains indeterminate. Likewise, an axe with a square butt was found in Brahmagiri IA phase and considerable discussion as to its value in understanding culture-contacts and movements followed. But this, as shown by DANI. seems to be un-

284. *BSOAS*, 1957, p. 329.

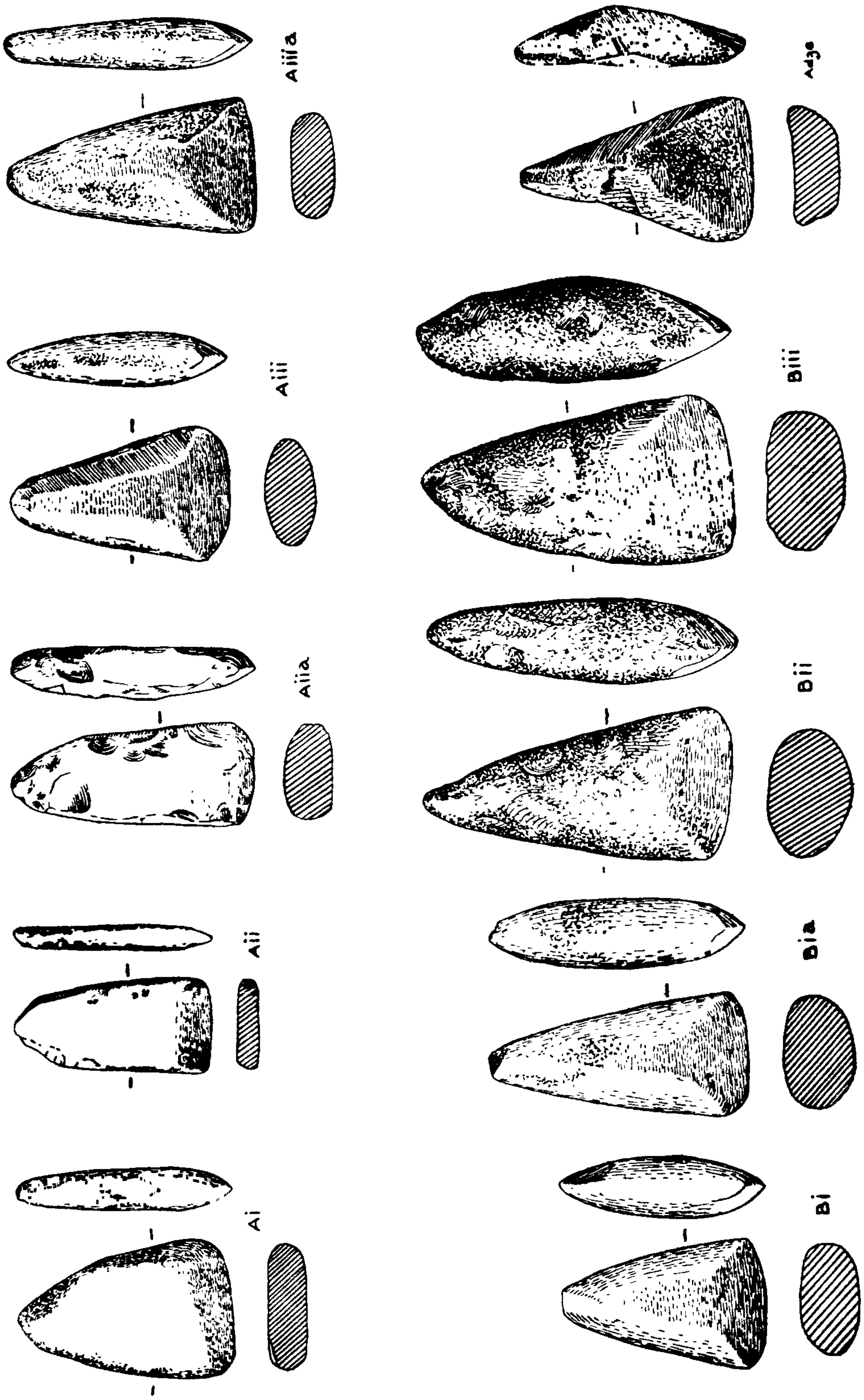


Fig. 122. Different types of Polished Pointed Butt Axes from Brahmagiri.

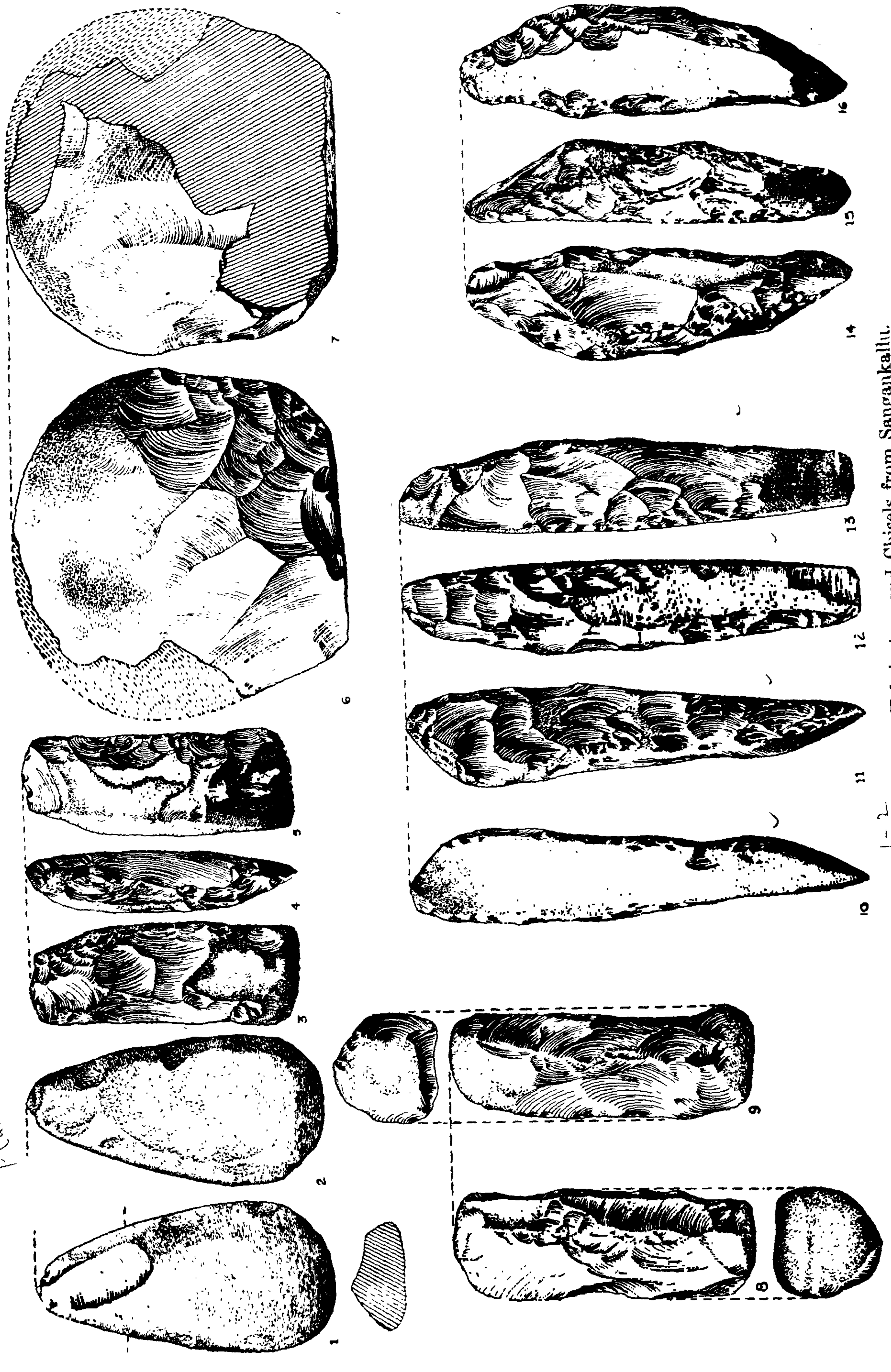


Fig. 123. "Shoe-last" celt, Fabricators and Chisels from Sangankallu.

warranted. For the variations in a given from depended largely upon the available raw material.

Near the butt, and say *normally* the axes in South-east India are triangular in form with a pointed butt and a section varying from oval to circular and from flattened oval to lenticular. The edges are generally convex, but at times straight. However, considerable variations occur even in this normal type, whereas all the eleven forms mentioned by FOOTE, and a few more are also found among the less common or rare types. Thus at Brahmagiri the two main sub-types :

(*a*) pointed butt axes with flattened lenticular section,

(*b*) with ovoid section,

has each three to four sub-types.

SUBBARAO and ALLCHIN in addition figure axes with square sides, or with blunt broad butt or with splayed edge or with fully ground and polished plano-convex surfaces as in a shoe-last celt. To this we may add an axe with facetted sides as in Assam. One from Maski is exhibited in the Archaeological Museum at Hyderabad, while another almost similar was seen in the reserve prehistoric collections.

Adze

The next important edge-tool is what is called the " adze." It is distinguished from the axe in that the latter has a regular median edge by bifacial grinding and is hafted parallel to the handle, while a true adze is not median and is bevelled on one side, the other being flat (either by grinding or naturally), and the edge is across the handle. It is this feature which makes the adze a distinctivec arpenter's tool in smoothing timber.

Because of its rarity, DANI[285] and ALLCHIN[286] remarked that a true adze did not form a part of the regular tool type of the South-east Indian Neolithic, though common in South-East Asia upto New Zealand. This is not quite true, for though rare, it is now documented from Bellary,[287] Maski (specimens in the Hyderabad Archaeological Museum), Piklihal,[288] Brahmagiri[289] and Nevasa.[290] And more might be found in other museum collections and future excavations.

Chisel

A narrow elongated axe, ground on both faces either fully or partly at the edge which is straight or convex, has been included under this group. However, ALLCHIN suggests a further criterion *viz.* that a chisel is not hafted and a tool to be so called does not show any signs of hafting. A chisel is different from a pick which has a pointed end, and is longer.

285. DANI, *op. cit.*
286. ALLCHIN, *BSOAS*, 1957, p. 327.
287. SUBBARAO, *op. cit.*, p. 35.
288. ALLCHIN, *Piklihal*, p. 89.
289. *I.A.*, No. 4, p. 250, fig. 33.
290. SANKALIA and others, *Nevasa*, p. 155, fig. 712, 6.

Chisels are again comparatively rare but have been reported from the districts of Anantpur,[291] Kurnool,[292] two sites in the former Hyderabad State,[293] Bellary,[294] Maski[295] and Piklihal[296] (Raichur District). FOOTE has given a six-fold classification :

1. Chisel with a square body.
2. Chisel with a cross-cut edge and very thick body.
3. Chisel with a thick triangular body.
4. Chisel with a broad elliptical edge.
5. Chisel with narrow thin body.
6. Chisel with a sharp point.

The last variety may go into the " picks."

FOOTE also cites a unique chisel from Anantpur[297] which has a short edge transverse to the axial plane.

Specimens from SUBBARAO's Bellary collection, Piklihal and from Nevasa are here illustrated. (*Fig. 123*).

Heavy, thick flakes or parts of nodules, either ground or unground, with a straight or convex edge have been included under this category of tools by ALLCHIN,[298] while SUBBARAO has grouped such a specimen under a thick broad butted axe. It is difficult to be dogmatic about any of the points of view in the absence of any positive evidence about the exact function of such a tool.

Scraper

A number of flakes litter the Neolithic factory sites, and some occur in excavations as well. From amongst these, those which bear signs of retouch could be regarded as " scrapers." Mention in particular should be made of a few discoid scrapers. These have been found both at Sangankallu[299] and Piklihal.[300]

Wedges

Small, roughly triangular, quadrilateral pieces, with ground edge and pecked surfaces are regarded by ALLCHIN[301] as " wedges " used for splitting wood and were probably made from broken axes.

Points or Pointed Tools

Picks and Borers or Pointed fabricators (hammers) form this small group.

291-292. FOOTE, *op. cit.*, pp. 99, 102, 117, respectively.
293. SUBBARAO, *op. cit.*, pp. 37-38.
294. *A.R.A.D.*, Hyderabad, for 1936-37 (1939), p. 16 and pl. X(a).
295. ALLCHIN, *Piklihal*, p. 89.
296. FOOTE, *op. cit.*, p. 21.
297. *Ibid.*, p. 99 and pl. 6, no. 1998.
298. ALLCHIN, *BSOAS*, 1957, p. 332.
299. SUBBARAO, *op. cit.*
300. ALLCHIN, *Piklihal*, p. 89, pl. 50.
301. ALLCHIN, *ibid.*, p. 89, and *BSOAS*, 1957, p. 332, fig. 8, nos. 23-24.

Picks

Picks as mentioned above are distinguished from chisels and from the pointed hammers as they bear traces of hafting.

Borers or Pointed Hammers

These are comparatively small tools about five inches in length, roughly flaked, with one end pointed and could be used for fine flaking and pealing and also for boring a hole in wood or stone, a ring-stone or mace-head for instance, as was done in New Guinea until very recently by the primitives there, according to a study cited by ALLCHIN.[302]

The Edged tools were generally made of fine-grained material, like dyke basalt, but the other group comprised by rubbers etc. was made out of coarse-grained stones, like quartz, quartzite, granites, schist, gneiss and pistacite.

Querns etc.

In this group there is no difficulty in understanding the use of concave querns, flat, plano-convex or rarely fully round mullers or rubbers, which were used for grinding and crushing grain etc., though so far no site in this region has yielded any traces of grains, and only the querns found hitherto are from the Upper Neolithic layers at Piklihal.[303]

Hand-hammers

Certain other small stones which are thick and rounded on one side and have a thinner battered edge were certainly employed as hammers.

Sling Stones

The problem is created by two other groups of round or almost round stones. One is fully round like a ball, with comparatively smooth surfaces made by pecking. These are about two inches in diameter on an average, but still smaller ones also occur.[304] The latter could easily have been used as sling-stones, but the larger ones would require some strength and a contrivance like the one used for bola stones.

Weights, Slickstones

In the second group fall specimens which are spherical or rounded, but with one or both the ends flat, right at the top and bottom. Thus these sit well. Such stones might have been used as weights[304a], though their use as hammerstones cannot be ruled out; or for polishing, as SUBBARAO has suggested and might be called " slick-stones " as well.

302. BLACKWOOD, B., *The Technology of a modern Stone Age People in New Guinea*, Oxford, 1950, pl. VIII C and E. ALLCHIN, *BSOAS*, 1957, p. 333, fn., 3.

303. ALLCHIN, *Piklihal*, p. 29.

304. See for instance, SANKALIA and others, *Excavations at Maheshwar and Navdatoli*, fig. 115, nos. 24-25.

304a. BANERJEE in *ibid.*, p. 240.

Grooved or Belted Hammer Stones

These have been mentioned before while discussing the Assam Neolithic. Though more common in this region,[305] none have so far been found from excavations.

Mace-head or Ring-stone

These are generally thick-sided rings about three inches in diameter having an hour-glass-like hole bored from both sides, probably with a pointed stone tool (and some abrasive like sand). FOOTE[306] has cited only one from Madura, but none has occurred in an excavation in this region. However, though rare, these do appear at Nevasa[307] and Navdatoli,[308] and in Period II at Langhnaj.[309] What its exact cultural and chronological significance is cannot yet be determind with certainty. It could be used as a weapon (mace-head), or simply as a weight for a digging stick.

Grinding Grooves

Associated at some sites with axes and other Neolithic tools are contrivances for grinding them. These are found, made in the face of the rock at Bellary,[310] at Kappatralla hill in Pattikonda taluka, Kurnool District[311] and at Poolloygooda,[312] 21 miles east by south of Bonagiri in the former Hyderabad State. Another occurs at Bilgi, near Bagalkot in Dharwar District; while these are in rocks themselves, a portable one[313] was found by ALLCHIN and SUBBARAO at Sangankallu, Bellary.

Though FOOTE had mentioned a number of other objects like pottery, terracottas, neck-rests, beads, besides polished stone-axes and microliths, it is only recently that we are able to appreciate their chronological significance, as these begin to appear in stratified context. Otherwise, polished stone tools alone were and could be assigned to this period.

Neolithic Blade Industry

WHEELER's work at Brahmagiri and SUBBARAO's at Sangankallu had shown that in addition to ground stone tools, blade tools also formed an integral part of the Neolithic or Chalcolithic stage in this region. Elsewhere, for instance at Nevasa, these blades seem to play a prominent part, the ground axe etc. being in a great minority, whereas at Navdatoli, large scale excavation did not yield a single ground tool, though ring-stones, querns, spherical balls, anvils etc. in increasing quantity. Since the latter occur in association with a little bit of copper at all the excavated sites, these have been called Chalcolithic.

305. FOOTE, *op. cit.*, p. 52 and pl. 60 ; SUBBARAO, *op. cit.*, and ALLCHIN, *Piklihal*, p. 91.
306. *Ibid.*, p. 52.
307. SANKALIA and others, *Nevasa*, p. 475.
308. *I.A.R.*, 1957-58, p. 35, fig. 19.
309. SANKALIA, H. D. and KARVE, I., in *American Anthropologist*, Vo. 51, 1949, p. 28, pl. 8d.
310. FOOTE, *op. cit.*, p. 81 ; and SUBBARAO, *op. cit.*, pl. A, 3.
311. *Ibid.*, p. 117.
312. *Ibid.*, p. 129.
313. ALLCHIN, *Piklihal*, p. 86.

Now Piklihal creates an interesting problem. Here these blades figure quite prominently with the ground pecked stone indusry. Should it be regarded as a part of the same Neolithic complex or an impingement from the northern Chalcolithic on the pre-existing Neolithic Culture ? The question has become relevant because in a small excavation at T. Narasipur on the Kaveri, Mysore District, SESHADRI[314] found only one core, but a large number of ground tools, pottery (some exactly like Piklihal) type and even a "neck-rest" first mentioned by FOOTE. Thus it is possible that the farther we go to the south, we meet with purer neolithic forms of culture, the true focus lying thither (or as has happened with Sanskrit, once having gone there it had managed to preserve its purity). Whatever way we may decide, *provisionally* a division of the Neolithic complex based on the occurrence or non-occurrence of a blade industry seems justified *at the moment.*

A similar phenomenon is observed in the north. While abundance of stone blades characterizes the Painted Pottery cultures of Maharashtra and Central India and the manifestations of the Indus Valley Civilization in Saurashtra, Bikaner and the Panjab, it seems to be absent from the Painted Grey Ware Culture and the Painted black-and-red Culture of South-East Rajputana.[314a] Copper objects are scarce in both, nor is there evidence of the knowledge of copper technology. Thus even in the north the existence or non-existence of stone blades may be taken as a diagnostic criterion for distinguishing between the various aspects of the Neolithic and Chalcolithic Cultures.

The blade industry of Piklihal is in every way identical with that previously reported from Jorwe,[315] Nevasa,[316] and other sites from Maharashtra and Maheshwar-Navdatoli in Central India. Large collections from the last mentioned sites have been technologically studied by SUBBARAO.[316a] In brief, it is evident that their makers (whatever way we may designate them), wanted to produce thin parallel-sided flakes (blades) on a mass scale. Some of these were later converted into blades like that of the penknife, or straight-sided ; some into tanged arrowheads, awls, drills, but continuing little with the old traditions of manufacturing lunates and trapezes. These latter were useful, as seen earlier, in composite tools.

For this mass production of blades, the corresponding cores were made in a particular manner, with the initial preparation of a guide flake. This flake has a crest, since it is made by cross-flaking on the core from two opposite directions. Hence it is called "crested guiding flake."

At Piklihal all these features are seen. The material is mostly brownish chert, the others in varying order being chalcedony, opal and quartz. Both these could be had in the form of river pebbles from the Krishna or from deposits in the trap and Bhima limestones, which occur at Hegragi, about 25 miles northwest of Piklihal.

314. *I.A.R.*, 1958-59, p. 33.
314*a*. But this as shown above can now be accounted for and the culture assigned to a Copper Age.
315. SANKALIA and DEO, *Excavations at Nasik and Jorwe*, p. 150.
316. SANKALIA and others, *Nevasa*, p. 114.
316*a*. SANKALIA and others, *Excavations* at *Maheshwar and Navdatoli*, p. 41.

It is however interesting and no less curious to note that at Maski, which is not more than 15 miles east of Piklihal, the blades are much larger as at Sukkur and Rohri in Sind, whereas at Piklihal, excepting some five, found in the burial, all are very small, exactly as one finds them in Maharashtra and Central India. No doubt, the size of the blades depends upon the size of the core, that is the available raw material. But if Maski knappers could get the required size of the core material, why was it not sought by the Piklihal people? Is it because they chose the Krishna pebbles, being very much nearer than either Maski or the more distant Hegragi, or is it because they belonged to a different tradition? As WHEELER said,[317] in a similar context, the availability of raw material is not the sole criterion for judging an industry.

Among the tool types, the majority[318] are parallel-sided flakes, or their sections (that is symmetrical broken pieces) and hence ALLCHIN suggests that this feature suggests multiple hafting. Backed blades come next, though the total number is about 1/10 of the former; then there are a few lunates, triangles, awls, scrapers, and one new type of tool called "*Eloura*,"[319] an Australian term for a large thick lunate steeply retouched on both sides. When hafted in gum, it makes a good tool for working in wood.

Copper Chisel

A copper chisel[320] of rectangular section and 6·25 in. long, 0·6 in. broad, 0·3 in. in thickness, beaten out of a copper bar, with its end slightly turned by hammer blows was found from Site VIIIA, layer 3, which is assignable to Upper Neolithic period. Typologically it is said to compare well with the copper chisels of the Indus Civilization.[321]

In addition two fragments of a copper bowl[322] were also found from the uppermost part of this period.

Terracotta Figurines

Of some importance seems to be the discovery of terracotta figurines of humped bull from the Lower Neolithic levels. These not only suggest the part these animals played in the economic life of the people, but it has also been argued that some of the oldest rock paintings and bruisings go gack to this period, "as certain features of the bruisings were closely related to the figurines."[323]

Majority of the figurines are of a humped variety of bull with long and curved horns. All are hand-made in A3 (reddish ware). While the hump and nose are indicated by small additions, the fore leg and probably also the rear formed a single cylinder.[324]

317. *A.I.*, No. 4, p. 299.
318. ALLCHIN, *Piklihal*, p. 106.
319. *Ibid.*, p. 99, pl. 51, no. 19.
320. ALLCHIN, *op. cit.*, p. 107.
321. MARSHALL, JOHN, *Mohenjodaro and the Indus Valley Civilization*, pl. CXXV, nos. 11, 14 nad VATS, M. S., *Excavations at Harappa*, pl. CXXIII, nos. 49, 54.
322. ALLCHIN, *op. cit.*, p. 107.
323. *Ibid.*, p. 78.
324. *Ibid.*, p. 79, pl. 40 and pl. 41, 2-3.

A human torso[325] of grey black clay with reddish slip, from the surface, is also assigned to this period. While it is definitely male, but whether in addition it is also *ardhanāri* (ithyphallic) cannot be said for certain.

The bull figurines are said to compare favourably with those from Area J at Harappa[326] and the thick red slipped ones from Chanhu Daro.[327] For these like those of Piklihal bulls have joined front and rear legs, high angular humps and long horns. This close affinity, it is argued, constitutes identity and gives some evidence of culture contact between Sindh and Karnatak.

Human Skeletons

The Neolithic layers also yielded three complete skeletons, one considerably crushed.[328] These respectively belong to a child, a female and a male, the first being the earliest. The child was lying on its side, while the female and the male lay extended on their back, with the female's head inclined to the right.

The female and male skulls appear to be mesocephalic and slightly prognathous. The teeth were well preserved, but considerably worn out in the case of the female and fairly in those of the male.

Dr. Ananthakrishnan AYER[329] who studied these three skeletons does not seem to emphasize the features which struck the eye such as prognathism. He regards them as " remains of a tall, sturdy people with large cranial capacity and a variable headform," and probably " the ancestors of a major element of the present mixed so-called Dravidian inhabitants of the Deccan and Southern India."

Origin

How did the Neolithic Culture of South-Eastern India originate? No guess was made by SUBBARAO. Wheeler[330] *very tentatively* suggested that the distribution of the polished butt axes suggested a movement from north-east to south-east. In his recent book[331] he has gone further and said that the axes might have been derived *via* China from Central Asia. ALLCHIN, on the contrary, argues for an Iranian origin, citing in particular (*i*) the close similarity in potting technique between Shah Tepe and Piklihal; (*ii*) the occurrence of grey ware at both the sites; (*iii*) certain pottery types—spouted and channel-spouted pots, and perforated vessels; (*iv*) the use of tabular basalt at Shah Tepe and also at Piklihal for making axes.

Further, it is argued that this culture came to India in the wake of a folk movement either *via* Southern Baluchistan through Seistan or else eastwards *via* Archosia into the Indus Valley. Owing to contact with the last mentioned

325. *Ibid.*, p. 81, pl. 40, 7 and pl. 41, b, 2.
326. VATS, *op .cit.*, pl. LXXXIX, 61-3.
327. MACKAY, E. H. J., *Chanhu-Daro Excavations*, 1935-36, pp. 155-7, and pl. LV, 9-12.
328. ALLCHIN, *op. cit.*, p. 113.
329. *Ibid.*, p. 154.
330. *I.A.*, No. 4, p. 295.
331. WHEELER, Sir MORTIMER, *Early India and Pakistan*, p. 89.

civilization, they developed or adopted the bull (***Bos indicus***) as an important part of their economy, and transplanted it into Northern Karnatak after being deflected south-eastwards and prevented from entering the fertile plains of Malwa and the Gangetic doab by the earlier inhabitants of these regions. In Karnatak they were once again reminded of their art of making stone axes by the plentiful raw material around them. Thus began the New Stone Age of South-East India or Karnatak.

It is also held on the slender evidence of the three skulls that these people from Iran or Central Asia were either of Dravidoid stock who mignt have introduced the Dravidian languages or a movement connected with the first wave of the Indo-Europeans.

Kashmir (Pls. XXXII-IV)

Very interesting and important light is likely to be thrown on the origin of the Neolithic Cultures of North-Eastern and Northern India by the renewed excavations at Burzahom, near Srinagar.

Conclusions of far-reaching importance were drawn from a small, ill-conducted excavation by Dr. De Terra's party. Again this was a time when very little was known about the various pottery types and fabrics, and so without even handling the pottery from the small dig, it was assigned to various periods. This chaos and confusion is now being removed.

On the ancient lake bed, called locally *karewa*, overlooked by towering mountains is located the site of Burzahom. It is about 24 kilometres north-northeast of Srinagar. From the plain stand out huge slabs of stone which were rightly regarded as the vestiges of a true megalithic monument.

Excavation here in 1960[331a] showed that as at Brahmagiri in Mysore, there were four periods in which the finds could be culturally and stratigraphically grouped. The topmost (IV) is of the early historical period. Below this is (III) megalithic which, as at Brahmagiri, is interlocked with the Neolithic (II). However, as in the southern megalithic the Black-and-Red Ware is absent, the only associated objects so far being a wheel-turned red pottery, a coarse black burnished ware, a few stone axes and bone tools. Whether the last two are survivals from the Neolithic is not clear, nor is the purpose of the megalithic monument.

However in the underlying Neolithic occupation were found remains of structures of mud and mud-brick, associated with a black burnished ware, ground stone axes, beautifully ground bone tools of varied type. Though all these objects are quite different from those hitherto known from the rest of India, the most outstanding are the bone-tools (*Pl. XXXIV, C*). Such awls, harpoons, and arrow-heads are quite unique in India. The ground-stone axes are said "to be different from their southern or eastern counterpart" in the sense that these have a broad rounded butt. (*Ibid, b*) But axes with such butts have been reported from south as well as Eastern India, though it is possible that the true home of the rounded butt axes is Kashmir or some such adjacent country.

331*a*. *I.A.R.*, 1960-61, p. 11, pls. XIII-XVIII. Report of 1961 dig is not yet available.

The black burnished pottery is now proved to be quite different from the NBP, and includes among the types a funnel-shaped vessel, basin with obliquely-cut rim, and a jar with splayed out rim.

The people of this period buried the dead. Of the two burials, one is said to be secondary.

Period I, the earliest settlement, is remarkable in the sense that it has given the first clear indications of a pit-dwelling in India. These pits are cut into the upper *karewa* bed and are roughly circular or oval on plan and about 1½ to 2½ metres (4 to 7 feet) in depth. The entrance to the pit is quite narrow. Deep pits have been provided with a landing step, while two adjoining pits are cemented with an arched corridor plastered with mud. Existence of charred reeds and post-holes suggests that these pits probably had a thatched roof, resting on pillars. Two C-14 determinations would place this culture around 15,00 B. C.

Among the household objects occur a few ground axes, bone tools, a handmade mat-impressed, steel-grey pottery, among which a deep bowl with a pedestal, and jar with flaring rim seem to be interesting. (*Pl. XXXIV, a*)

From our point of view Period I and II are important. Without a detailed study of the finds, particularly pottery, bone tools and stone implements, it is not possible to point out the affinities. But Iran and China are the most likely sources. BRAIDWOOD has recently reported bone tools from Iran. But no detailed description of ground axes from this region is yet available.

Significance of the New Discoveries

We may now pause for a time and briefly discuss the significance of these new discoveries in the Gangetic Valley, Central India, Rajputana, Saurashtra, the Deccan and Karnatak.

While the economic stage at which the bearers of these Neolithic and Chalcolithic cultures were is fairly well understood, as yet we have no idea who these people were, in the absence of written record from any of these excavations. The skeletal material though available in some quantity from the Deccan sites is inadequate for venturing an opinion about the racial types of the people.

Nor do we know whether these people came from outside India or wers indigenous. This is not easy to answer. We are up against the controversies which raged in the last century and which to some extent are still plaguing our minds today. Those who believe in the theory of independent origination of cultures would argue that the various cultures in different parts of India which archaeology has revealed during the last ten years show that when the great Indus Civilization was flourishing in Sind, Saurashtra and the Panjab, the rest of India was developing the various regional cultures.

The authors of these cultures might have been the ancestors, as has been suggested by Professor HAIMENDORF,[332] of some of the primitive or aboriginal tribes now confined to the forests and hills of Madhya Pradesh, Orissa, Bihar and

332. Presidential Address, *Proceedings of the 37th Indian Science Congress*, Part II, p. 176.

Andhra, tribes like the Gonds, Baigas of Bastar or the Oraons and Savaras of Chota Nagpur or the Chenchus of Kurnool. In the same way, it might be held that tne Bhils and Mundas—who are supposed to be some of the Kolarian tribes from the north-west driven to their present forest habitat by the Aryan speaking people,—were the bearers of the various Chalcolithic cultures of Rajputana, Central India and the Deccan. In fact, our *Puranas* and other literature do speak of Bhillas, Nishadas, Pulindas (even Andhras) and other tribes as inhabiting these regions. However, these references are admittedly late, much later than the Neolithic Cultures which are about 2000 B.C.

The second difficulty is that though all these tribes are in varying stages of hunting and food-collecting stage, practising primitive agriculture by burning forest enclaves and ignorant of the real art of ploughing, still none of these have any knowledge of fine pottery or of chipping and grinding of stone implements which characterize the Chalcolithic and Neolithic cultures respectively. It is possible, as argued by some anthropologists, that this is due to de-socializing and de-culturalizing factors. For example, within the historic times some of the tribes like the Hunas and Gurjaras having once been empire-builders, have sunk back to a life of shepherds. This is possible. But the links with the past have to be established. These might be had if excavations in the present secluded habitat of the primitive tribes are carried out and yield traces of cultures which they (their ancestors) had carried with them when pushed back by the oncoming Aryans.

The diffusionists on the contrary discern in these cultures, though known so far in some cases only by pottery—which is but an industry and not the totality of a culture—the spread of Aryan or Dravidian-speaking people from Iran or Central and Western Asia which in our present knowledge had witnessed the various steps in the growth and birth of civilization. In support of this view is pressed the stock argument of movement of peoples in about 2000 B.C. and earlier owing to pressure from stronger groups. Within India destruction of the Indus Civilization and dispersal of the refugees and survivors to places of safety and more favourable areas was also cited as an argument for the civilizing touch to the rest of India which was believed to be inhabited by hunters and food-gatherers.

Thus from the juxtaposition of the Mahabharata and Painted Grey Ware sites in the Gangetic Valley and the occurrence of the latter in Sind and Baluchistan and in the distant Thessely, Shri LAL[333] has pointed out the possibility of the bearers of this culture as being a group of Aryans from Shah Tepe or some such site in Iran.

Likewise the writer[334] has collected evidence from recent excavations at Navdatoli, Chandoli and elsewhere showing how one may argue for another Iranian wave or waves of peoples and/or ideas which helped in the colonization of the Chambal, Narmada, Tapi and Godavari Valleys. One may go a step further and identify some of the Aryan or mixed Aryan tribes mentioned in the Puranas

333. *A.I.*, Nos. 10-11. Now another site Hasanlu in Persian Azerbaijan has given a burnished grey ware which is dated 800 B.C.-1000 B.C. and attributed to Indo-Aryans. Dyson in *I.L.N.*, September 30, 1961, p. 537.

334. In *Illustrated London News*, September 5, 1959 and *Sārdha-Satābdi*, special volume published by the Asiatic Society of Bombay (New Seires), 1959, pp. 229-39, and in *Artibus Asiae*, 1962-63. See also *I.L.N.*, September 1, 1962, p. 322.

with the authors of the Chalcolithic cultures in the above mentioned valleys. For all these are tied by common features and differ from valley to valley, according to the pottery fabrics and types. But their basic way of life remains the same.

This theory would remain unconfirmed unless and until some writing is found in their excavated habitations which identifies at least some of them with one or two of the Puranic or Vedic tribes. But this may never be found, as they were illiterate—and Aryans are believed to have been illiterate—in spite of the high philosophical and spiritual content of the *Rigvedic* mantras, in spite of the metaphysical speculations of the Upanishads, and in spite of the earliest etymological efforts of Yaska and the first systematic grammar of Sanskrit by Panini.

Thus the actors on the Chalcolithic stage remain hazy, almost unknown. It is towards their identification that all our efforts should now be directed.

Aryan-Iranian Influence

This process of Aryanization or say better Iranian penetration into India is believed to have started a little earlier. For, according to ALLCHIN, the Neolithic Cultures of Northern Karnatak (and also of Southern India or Mysore, for it has given almost similar data) owes its origin to a migration of people from Iran and Central Asia. These might be Dravidians or speakers of an Indo-European tongue. There is nothing inherently wrong or impossible in this hypothesis; what happened a few centuries later could have taken place earlier. The difficulty is of establishing proper links between these far-flung regions, Iran on one side and Central India and Karnatak on the other.

First, let us take up ALLCHIN's theory. If we accept the migration of a group of people from Iran (say about 2500-2000 B.C.) accustomed to the making of grey ware pottery in a particular manner, used to grind stone axes and knowing copper-bronze technology, gradually moving south-eastwards towards India, then traces of such people should be found in Baluchistan and/or Afghanistan, Sind and Rajputana and/or the Panjab or Saurashtra. Nowhere, except at some sites in Baluchistan, are the ground tools found ; and that too very few.

Within India, or the north-western frontier and the adjacent regions, no tools are met with except some solitary references from Sind and Rajasthan. But there are none from Saurashtra, excepting, however, mace-heads or ring-stones, of which one has been cited by FOOTE, and another was found in Zone II at Langhnaj, along with a coarse-reddish pottery and criss-cross incised decoration and microliths. Farther eastwards, barring the recent stray find from Eran on the Bina, Rajghat, near Lalitpur, and Maheshwar on the Narbada, no ground tools are known until we reach the Banda and other districts of U.P.

It is difficult to say whether this absence of ground tools is genuine due to want of raw material and consequent non-development of the industry, or due to want of explorations. However, things are different since 1947, when WHEELER commented on this very unequal distribution. For considerable work has been done in Saurashtra, Rajputana and Malwa, but excepting the two instances mentioned above, the distribution map is blank as before.

Thus the ground stone industry seems to be really non-existent, and for this we should not lay all the blame on the raw material; for both Malwa and Saurashtra have trap or basalt, with fine-grained dolerite dykes as well. And therefore to infer that the Iranians remembered their art of grinding tools only after reaching Karnatak, that the migrants were not allowed to enter the rich river valleys by the earlier inhabitants, seems far-fetched.

The case of pottery is similar. So far mostly red ware, some painted, has characterized all the regions referred to above. ALLCHIN, however, cites the black-and-red ware from Lothal, and thinks that it is related with his grey ware and the one from Shah Tepe. But the former is quite different both in technique and form, though its source remains untraced. With regard to the characteristic forms—the channel-spouted bowls, for instance—we shall discuss its case below.

Regarding the terracotta figurines of bulls from Piklihal, the alleged identity between these and those from Harappa and Chanhudaro is not so apparent, because the Piklihal specimens are all broken, and a detailed comdarison is not possible. Secondly, the *Bos indicus* was already there in the Deccan and Malwa by the beginning of the Holocene as revealed by finds of fossil jaws and teeth from Nevasa[335] and Gonchi on the Betwa, near Bina, Saugor District.[336] So, ALLCHIN's argument is difficult to understand.

Lastly, to argue on the strength of the two skulls about the Dravidoid or Indo-European penetration into Karnatak without similar data from the intermediate areas can be called nothing but an overbold attempt. The evidence from Nevasa skeletons, though again not much, points the other way—to a primitive aboriginal population.[337]

The full report[338] of the Brahmagiri skeletons is now available. "The crania from megaliths reveal an autochthonous Austroloid type and a more or less medium statured, mesocephalic, medium-vaulted, flat-nosed type with robust constitution and powerful upper and lower jaws, probably of the Scytho-Iranian stock." The latter group is believed by some scholars to have migrated from Iran between 2000 B.C.—1000 B.C. But for this no evidence is forthcoming from the Stone Age Culture at Brahmagiri. Here the single child skull is said to be "of the autochthonous Australoid type." Similarly it was the view of Prof. (Mrs.) ERHARDT of the Nevasa Chalcolithic skeletons, a majority of which belongs to those of children. Thus Aryan or Aryan-speaking people are ruled out.

In summary, then, the Iranian origin of the South or Karnatak Neolithic may not be accepted until more evidence comes from this region proper and the intermediate areas.

What about the Chalcolithic Cultures of Central India and the Deccan? Here two of the characteristic features of the cultures are (*i*) Stone blade industry and (*ii*) Painted wheel-made pottery. SUBBARAO has shown how the first can

335. *I.A.R.*, 1954-55, p. 5.

336. Found by Shri RAMESHWAR SINGH of the Deccan College. This tooth was identified by the Zoological Survey of India.

337. EHRHARDT in SANKALIA and others, *Nevasa*, pp. 506-40. Here p. 222.

338. *Bulletin of the Department of Anthropology*, Vol. IX, No. 1, 1960, p. 24.

be derived from Western Asia and as far afield as France. Regarding the second, some of the arguments which vitiate ALLCHIN's theory of an Iranian origin also apply to our hypothesis, though affinity in certain forms—channel-spouted bowl, anthropomorphic vases and low and high footed bowls and goblets as well as certain designs—do recall similar forms and designs from Iran. It is also true that Iran has been influencing Baluchistan and Sind from at least the 4th millenium B.C. and has continued to mould the Indian Culture throughout the historical times, still for the period in question 2000 B.C.-1000 B.C. well-linked data should be available from the regions which separate Iran and Central India. Thus, so far the channel-spouted bowls identical with that in Tepe Giyan in Eastern Iran has been found from Navdatoli, Central India, and Southern or Central Rajasthan, whereas analogous spouts have been reported from Gilund in South-east Rajasthan, Nevasa and Chandoli in Maharashtra, Piklihal in Northern Karnatak, Patpad in Kurnool, T. Narasipur in Mysore, Sonepur in Bihar and now from Rajar Dhipi in West Bengal.

Likewise footed cups of the type known in Eastern Iran have been reported from two sites—Navdatoli and Rangpur. Whether such specialized vessels exist in Rajputana, Malwa, Saurashtra and Sind is not known, though already in pre-defence deposits at Harappa, Baluchi and Iranian type bowls are recorded. Later such types appear at Navdatoli.

Thus unless we can show by well-marked stages the route or routes by which all these three types of vessels reached Rajasthan or Navdatoli, we cannot positively postulate an Iranian origin for the Chalcolithic cultures of Central India and the Deccan, though the case is a little stronger than that of the Neolithic. However, the question might be left open for an independent, indigenous origin for both, though there is no doubt that the south received the Chalcolithic elements in its culture from the north.

Owing to this uncertainty, this dearth of positive data about the origins of the Chalcolithic and Neolithic cultures in India, we are unable to endorse wholly the view that the impetus to march forward from the Stone Age, from the stage of a savage and barbarian—to civilization spread from "the Fertile Crescent' of BREASTED or the grassy hill country (in the same zone) according to BRAIDWOOD (*Fig. 1*). For instead of one centre or cradle of civilization, there might be many, depending upon several factors among which environmental factors might have a limited influence. This was indicated by the discovery of a pre-pottery wall (believed to be that of a town) at Jericho in arid wastes of Palestine, but the site being fed till today by a perennial spring. Such an unusual phenomenon has already rent a chic in the diffusionist camp and set them thinking. A lively discussion followed. The effect of this is visible in a recent statement of BRAIDWOOD.[339]

Now on the heels of Jericho comes Petra,[340] another important site in East Jordan. Around this Roman town, at Seyl Aqlat, Beida, traces of a pre-pottery culture, some 8,000 years old, have been very recently revealed. This once again proves that too much emphasis should not be laid on merely environmental factors. Provision has to be made for exceptions.

339. Cited above in Introduction, p. viii.

340. KIRKBRIDE, DIANA, in *Illustrated London News*, September 16, 1961, p. 448.

In the God's favoured zone, viz. the Fertile Crescent, Jarmo can no longer claim to be the only place where the earliest steps in civilization were believed to have been taken. For at Haçilar[341] in Turkey, JAMES MELLAART discovered nine building levels, the earliest a pre-pottery phase dated to 6000 B.C. Several types of grains including wheat and lentil were found in slightly later phases.

Further, the world's earliest town makes WHEELER[342] think that the anthropological definition of civilization is arbitrary, though perhaps precise, and so are sociologists viewing many of our former pre-conceived views of morality and social behaviour. Moreover, the antiquity of man himself has been taken by potassium-argon dating to a million years further back in the past. Formerly it was 6,50,000 years. Now *Zinjanthropus* and the pre-Zinj child from Olduvai, Tanganyika, East Africa, are dated to 1,750,000 years.[343]

When new knowledge about man and his past is steadily pouring in, it is best not to be dogmatic, but to be ready to modify our own position according to the needs of the situation.

Indigenous Origin

Thus on the one hand the view about one or two regions alone being the birth place of civilization is being revised. On the other, if it is proved by further work that some of the primitive or aboriginal tribes are to be credited with the Mesolithic and even the Chalcolithic cultures, then naturally it would imply that these are indigenous or autochthon and not inspired by outside influences. Then the relation of this fact to the geographic factors will have to be re-examined. Otherwise, on the current theory, it is held that the bearers of a superior culture came along the principal lines of communication and gradually occupied the most fertile river valleys, ousting the hunters and food-gatherers to Central Indian forests and hills. It is in this way that we can explain the unequal development of Indian civilization; for some areas, because of their natural resources and nearness to the highways, attracted settlers; some like Northern Gujarat, because of semi-aridity were settled late, and others like Assam, Kerala and Central Indian forests became refugee areas—areas of isolation—where the aboriginal tribes continued to live on in a hunting stage till today.[344]

SOME GENERAL PROBLEMS

Slow Development

The account of Indian prehistory and protohistory here presented is indeed very much disjointed. Still the main outlines of the story—shall we say its personality—may be faintly but definitely discerned. This is a very, very slow progress of man from the age of food-gathering and general, all-purpose, tools to that of food-production and finally civilization, when with increasing needs the tools became more and more specialized.[344a] However, another change is also noticed. This is (sudden) emergence of regional variation in pottery forms

341. *Illustrated London News*, April 8, 1961, p. 346. For location see Fig. 1.
342. In the *Dawn of Civilization*, p. 243.
343. LEAKEY, L. S. B. "Exploring 1,750,000 years into Man's past," *National Geographic*, October 1961, p. 564.
344. SUBBARAO, B., *The Personality of India* (2nd ed. Baroda, 1958), pp. 20-27 and Fig. 6.
344a. See the charts facing p. 274.

FROM FOOD GATHERING STAGE TO THE THRESHOLD OF PASTORAL STAGE

	N. W. INDIA AND KASHMIR	RAJASTHAN	CENTRAL INDIA	WESTERN INDIA	SOUTHERN INDIA	EASTERN INDIA
HOLO-CENE		DHANERI (W.R.) BICHRI (E.R.) DABOK (E.R.)	PANCHMARI MAHADEO HILLS ADAMGARH	RANGPUR-A WAI PANCHGANI LANGHNAJ-B KANDIVLI LANGHNAJ-A	MYSORE BELLARY NELLORE GIDDALUR KURNOOL TERI NANDI KANAMA	SINGHBHUM ORISSA SINGRAULI BIRBHANPUR
LATE PLEISTO-CENE	ROHRI-SUKKUR LATE SOAN-B LATE SOAN-A	(LUNI) NEVASIAN-A	NEVASIAN-B [SR III] (SIVNA, BETWA, DHASAN) NEVASIAN-A	NEVASIAN-B [SR. III] (PRAVARA-GODAVARI) NEVASIAN-A	NEVASIAN-B [SR. III] (GHATAPRABHA) NEVASIAN-A	NEVASIAN-B [SR. III] (KHADKEI & TRIBUTARIES) NEVASIAN-A
MIDDLE PLEISTO-CENE	EARLY SOAN HAND-AXE CLEAVER	HAND-AXE CLEAVER	HAND-AXE CLEAVER	HAND-AXE CLEAVER	HAND-AXE CLEAVER	HAND-AXE CLEAVER

Fig. 123a.

and fabrics, though tools of stone and metal (soon) became stereotyped. Equally striking is the disappearance of these pottery fabrics with the introduction of iron. No doubt, some momentous changes in the political, social and cultural life of India, are presaged by these phenomena.

Origin

The second fact is the question of ultimate origins of the various cultures and their diffusion. Here one has to be wary, and not accept the various views very glibly, without sufficient consideration. First, there are undoubted indications, owing to the proved antiquity that all the important steps in the march towards civilization--from the state of an ape and savage to modern man,--such as tool-making, from that to specialized efforts, and then self-sufficiency in food production, discovery of metal technology—were all taken outside India in Africa and in the high grassy lands surrounding the Fertile Crescent. Secondly, owing to India's peculiar geographical position the various discoveries and inventions gradually spread to India, and some even managed to survive.

Thirdly, that such a course of events is well supported by later and modern history. Witness for certain, the refugees from Tibet, West Panjab and East Bengal.

Paradox

It appears however equally true that after receiving the varied cultural influences India has transformed them into something totally new; the fully urbanized (materialistic) Indus civilization, for instance; and this to be followed by a paradox, a deep-rooted spiritual and detached outlook on all things of life!! Formerly, this attitude, first preached in the Upanishads, was credited to the Aryans. Now the pendulum has swung the other way. It is variously attributed to the Dravidians, or pre-Aryans or even to the Tibeto-Mongolian element in our ethnic composition.

Partial Approach

However, it must be said that the problem of ultimate origin and diffusion is not so simple as that. Discoveries in Palestine have already given it a rude shock. And therefore Sir Mortimer Wheeler is (perhaps) constrained to say " Archaeology, in its search of ultimate origins, can readily overlook the possibility that those origins may lie very largely at our feet." On another occasion, he found literacy, as a test of civilization, arbitrary. All this underlines the vagueness and our very, very partial realization of the truth, because of our, often, one-sided limited approach.

This is true also of the sister sciences of linguistics and anthropology leaning on which so many theories and counter-theories are propounded. Unfortunately, these though cautiously formulated are passed on as accepted truth doing immense harm in the sequel to peoples and nations (thus the Aryan theory in Germany and the Dravidian in South India).

Concerted Project

Truth will always elude us, unless each of these and other disciplines are pursued intensively and also in collaboration with each other. Hence a concerted

project by nations and institutions is urgently necessary to help understand the problems of origin and diffusion. Right in India, no archaeological work has been carried out in the so called " tribal areas," and hence as WHEELER would say without searching our own house, we are trying to search elsewhere. Lacking such data, no large conclusions are drawn, but some *possibilities* are *merely* suggested.

Let us now review the important features of each of the main Stone Age Cultures and discuss some very general questions. It is widely accepted that during the Middle Pleistocene times the whole Old World was divided into two Lower Palaeolithic Cultures viz. the Sohanian (Chopper-Chopping) and the Hand-axe.

Is Sohan a different culture?

Beginning with the Sohan itself, it must be said that the evidence given by the Yale-Cambridge Expedition, though excellent, as far as the geological aspect is concerned, leaves much to be desired so far as the discussion of the tools' significance is concerned. We have no idea at all either of the form or of the number of handaxes which were found in the Second Interglacial deposits after the Boulder Conglomerate stage. Even in the Early Sohan there is a tool type which is called proto-handaxe and similar tools have been reported from Patjitan in Java and recently more tools have come from that area. This casts a doubt on the whole question. Is it not possible to say that we have got a pebble element in the handaxe culture of the Panjab, instead of regarding it as a quite separate cultural entity? Unfortunately no statistics are available about the Early and the Late Sohan material as also for the handaxes and cleavers found from Chauntra. It is felt by the writer and some of his other colleagues in India that a re-examination of the crucial sites in the Sohan valley is necessary. Of course, this cannot be done without co-operation from Pakistan. Pertinent in this context is the discovery at Olduvai in East Africa. Here along with pebble tools flakes and nodules were found on a habitation floor. Hence Dr. Desmond CLARK has suggested, as mentioned before, that the term " Pebble Culture " should be replaced by a more comprehensive term " Oldowan Culture."

Another problem connected with this is the meeting ground or the contact of the Sohan culture with the Hand-axe culture. After Krishnaswami reported such a contact in Northern Gujarat, so many other sites in Mirzapur, Orissa, and Eastern Rajputana—have been found and their discoverers regard these as meeting grounds of the Sohan and the Hand-axe cultures. What is forgotten in all these is that at a number of places, hand-axes were made from quartzite pebbles and when we go towards the upper reaches of the river, more and more pebbles or pebble-halves become available. This was what we observed at Hadol, Valasna, and other sites along the Sabarmati in Northern Gujarat. So what we record as a typical Sohan chopper made on a pebble may not necessarily be a tool of that culture, but simply a pebble which has been flaked into halves either naturally or artificially. But unless it shows that typical technique of the Early Sohan in which the flaking has been from the underside up, one should be very careful in recording all such pebble tools as Sohan choppers. In this, statistics are no guide. On the contrary they give a wrong direction. For instance, in Kurnool ISAAC's collection contains nearly 40 per cent of pebble tools. Needless to say that this, if interpreted as Sohan influence, would be something very

astounding. The fact is otherwise. Tools collected from the upper reaches or wherever pebbles are more, would generally give tools made on the pebbles. But it does not *necessarily* indicate the Sohan contact.

Uniformity in Hand-axe Culture

It is a remarkable fact and often noted by other scholars as well, that there is almost a uniform distribution of hand-axes all over India. Even the tool types are so identical, not only within India, but the tool types from Africa, India and Western Europe are so uniform in nature, that one wonders how such a great uniformity could have been achieved in such distant times and regions when communications were so very difficult. It is still an unsolved problem of Palaeolithic archaeology, as to how one can account for this wide distribution and uniformity of types. Is it to be attributed to the slow migration of ideas or to the migration of man himself? Whatever be it, it speaks volumes for the diffusion and the way it took place. This diffusion even cuts across all kinds of raw material, whether it be flint of Western Europe, or quartz, quartzite or very coarse sandstone, as for example around Lalitpur,[345] in Central India or dolerite in the Deccan. Man has been able to achieve beautiful results in preparing ovates, and other kinds of hand-axes and cleavers.

Ecological Studies

A question which has not yet been attempted, but should be undertaken now, is the relation of the Palaeolithic industries to the geographical regions and ecology of each area. It has been found that generally man lived all along the river banks. But even here, he seems to have avoided very high altitudes, which were densely forested and very marshy areas like the river deltas. The reasons are obvious. In thickly forested, high areas, he would not find the game animals, as even today these inhabit the lower altitudes between 2500 and 500 ft. or so. For similar reasons very cold areas, like the Kashmir Valley, seem to have been found unfavourable for habitation by the Early Man. No tools have been so far found in this Valley, whereas the foot-hills abound in them. However, these are inferences which require to be confirmed by still closer examination of higher regions as well as purely coastal areas. Of course, when we say coastal areas, one has to make an exception for areas like Kandivli, near Bombay, which today are not very far from the sea and probably were not so in the Palaeolithic times either.

Pleistocene Geology

However, the greatest need for Indian Palaeolithic studies is the search of stone tools and the related data on more scientific lines. This can be done only when students having training in several aspects of Pleistocene geology come forward and pursue the subject. It is also desirable that one or two river valleys are taken up and studied fully, rather than collections from a large number of areas from the surface or otherwise and deposited in some office or museum. It is not the stone tools that we want. But the stratigraphical evidence for these tools. For, the problem is, is there any evolution in the Indian Lower Palaeolithic as witnessed in the West and in Africa? Or is there no vertical division?

345. Recently collected by Shri RAMESHWAR SINGH, Research Scholar of the Deccan College.

Absolute Dates

Above all, what we need badly are absolute dates for these Stone Age industries. This can be achieved only if we lean more and more on the sister sciences of botany, geology, chemistry and others and examine in the laboratory the gravels and other things. The whole question has assumed a new turn after the latest discovery in East Africa. Tools in India, if not 17,00,000 years old, might be at least half that old !! If they are, how do we explain the subsequent development or non-development? Are the succeeding stone indusries also correspondingly older ?

River Terraces and Sea Levels

Side by side, the river terraces have to be correlated with sea levels, particularly in the lower reaches, where owing to the rise or subsidence in the sea level in interglacial and glacial times respectively, the river beds were raised or lowered. Such studies will not only tell about the various tool types, but the environment of man and this is the important thing, not the tools. When such studies are under taken, I am quite sure, that the fossil man will also be found, because so far we have got his tools, but not the man and that is naturally one-fourth ot the search of the Early Man in India.

Mesolithic Problem

We then come to the problem of the Mesolithic period in India. This can be solved to some extent only if excavations are carried out in some closed or semi-closed areas like the rock-shelters, caves, or mounds, as in Gujarat or Birbhanpur. It is also necessary to once again relate the mounds where the microliths occur to the various ecological zones. Nowadays, microliths seem to crop up everywhere. Does it mean that the microlithic man lived anywhere and everywhere or did he prefer certain, dry, sandy areas as in Western Europe and Africa and also as demonstrated by the discoveries in Northern Gujarat and the *ṭeris* of South India ? These are indeed important questions, because they throw light on the life of these people. Equally important is the fact of the origin of these cultures. Did these microlithic cultures follow the Upper Palaeolithic cultures, as in Western Europe ? Or did they owe their origination to influences from Africa ? These questions need first-hand study of the tools in India and Africa and above all material from well excavated sites.

The sites like Langhnaj, it is believed, will lead us to incipient food-production. For the occurrence of small, quern-like stones is assumed to signify querns on which grains, if not cultivated but collected wild, were ground. Now this is an important deduction which requires to be proved by a study of these quern-like pieces and then by the study of the soil samples. If they contain any pollen grains[346] of ancient or prehistoric grains, then it will be an important step towards the question of food-production in that time.

Neolithic Question

Neolithic studies are in a very poor stage at present. Except for surface finds here and there, nothing much is known, and typology is not a sure guide, as it is considered so often. Not only small but large scale excavations in Andhra-Karnatak where the tools abound and in Eastern India are over due. Without

346. Though it is doubtful if pollen grains would survive in a calcareous sandy soil.

evidence from such excavations, no discussion of a detailed nature is indeed advisable.

Significance of Pottery Groups

A large number of pottery groups or industries have emerged in different parts of India as a result of recent excavations. These have rightly been interpreted as guides to cultural diffusion. When for instance, NBP (the Northern Black Polished) potsherd is found as far south as Kolhapur, some hundreds of miles away from its main home in the Gangetic Valley, it may be attributed to the Buddhist bhikshus who carried it to different parts of India in their pergrinations along the continental highways. But when we examine this question in detail, regarding still earlier pottery groups, like the Jorwe-Nevasian or the black-and-red ware, the problem gains great significance and importance. When we were searching for the Jorwe-Nevasa sites along the Pravara, we found that the sherds of these could be had in far away, remote and hilly places along the tributaries of the Pravara. Even now one would not think of going to such distant corners of the Pravara Valley. One wonders then, " why did people of Jorwe-Nevasa culture go so far into the interior? From where did they come? Did they come from the south and spread northwards along the main river valleys like the Godavari and the Pravara and its tributarires, or did they come from the north and followed a similar procedure? "

And a still more important question is, who were the bearers of these pottery industries? " When we think of pottery as an index of culture, it is not talking in a vacuum. For, pottery is so specialized in fabric as well as in form, that it does represent a particular cultural trait and/or a group of people or tribe. I would not say " race " because it is too big a word and should not be used so loosely. Do the various pottery groups like the Grey Ware, the black-and-red Ware with paintings in white from Ahar, the Lustrous Red Ware of Rangpur and the particular Somnath Ware with in-turned rims and designs in panels over a matt surface represent merely cultural elements or certain groups of people or tribes? It is actually this that is at the back of our mind, when we say that in Period II at Rangpur or Period III at Navdatoli we have got this and that kind of ware. Somebody must introduce these new fashions. So far of course, we have no idea about these groups or tribes of people.

Puranic and Vedic Tribes

Amongst the many alternatives in which this question could be discussed, I would put before you two alternatives: one is the juxtaposition of these various pottery groups with the different Puranic tribes. For instance, when we find that all along the Narmada, the Malwa Ware is spread, then is it possible to say that this might have been the pottery that was brought and made popular by the Haihayas or one of the branches of the Yadavas? In the same way, the Painted Grey Ware culture is assumed to be connected with the arrival of the Aryans. But one might go a step further and equate these Aryans with one of the tribes of the Aryans viz., the Bharatas who occupied the Ganga-Yamuna Valley. We shall have to think of similar equations for the Painted black-and-red Ware at Ahar and the two or three wares which occurred immediately after the destruction of the Harappan civilization in Saurashtra and in Sind. Of course, I do not want to press this point too far, because unless some written evidence or evidence of a more exact nature comes forward, one cannot say in text-books that the Malwa Ware represents the Haihaya penetration into the

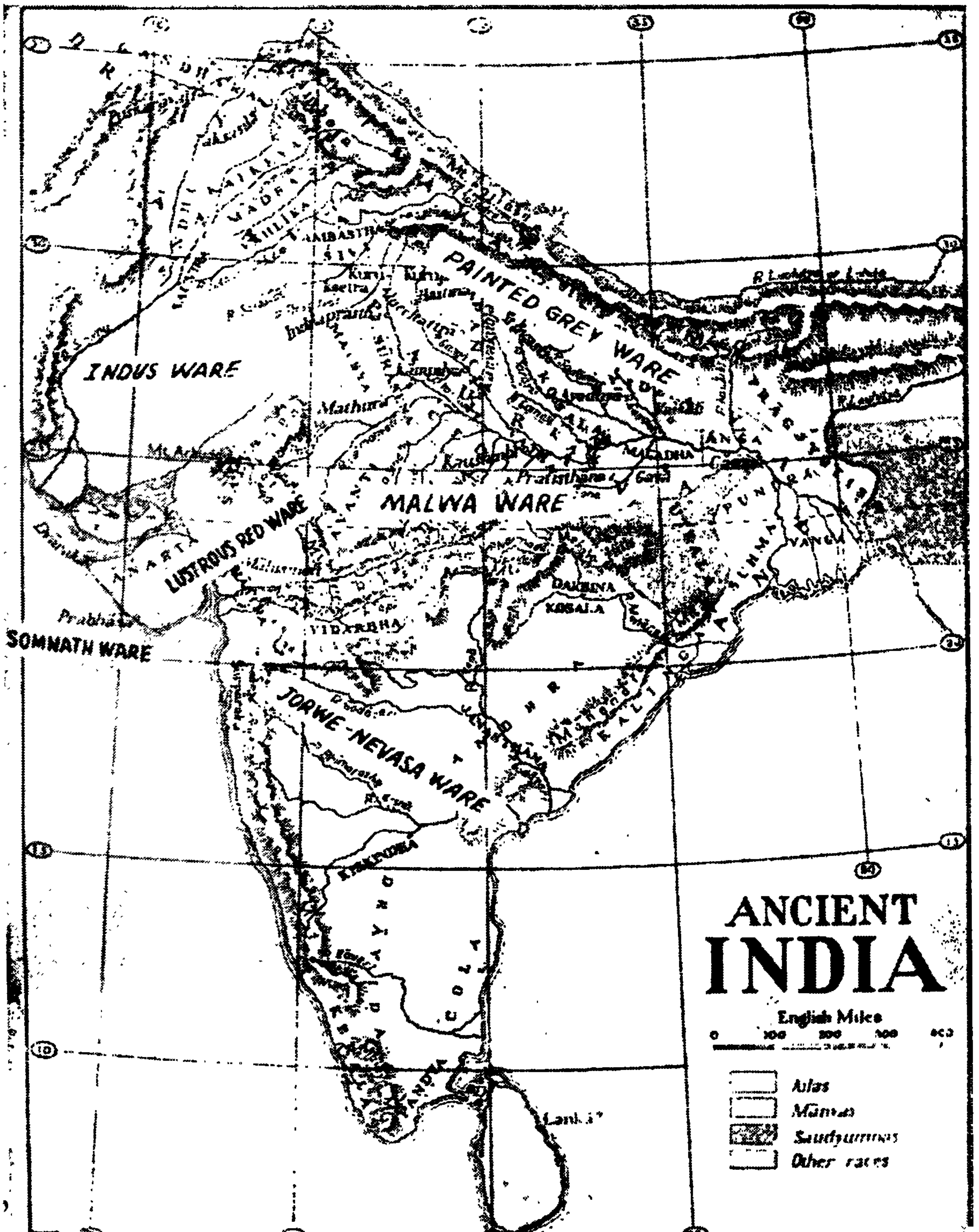


Fig. 124. Puranic Tribes and Pottery Groups.

Narmada Valley. For, we should avoid all these questions of race and culture which shook Europe in the late 19th century[347] and even as late as 1930. But in a country like India which has got a very, very ancient tradition preserved in its Puranas, the two epics, and the Vedic literature, one should not over-look such possibilities, even though a large number of scholars would regard the Puranas and the epics as purely imaginary.[348] I think that these works, however much inflated, do contain an element of truth, and particularly the lists of various ruling dynasties. They may be inflated, but names of the dynasties and other essentials should be true and approximate to truth. It is in this way that we can give some form to the Puranic dynasties, whereas our potteries may be given some individuality.

Iranian Penetration

Related to this is the Aryan or, better say, Iranian problem. I have already said on several occasions in lectures in Bombay as well as elsewhere, that evidence from Maheshwar and Navdatoli in the shape of particular pottery vessels,—the various vessels with footed-stands called "goblets" and the bowl with a channel spout resemble so much similar vessels from Iran, that one has got to postulate some kind of connection between Eastern Iran or Western Asia and Central India. In this context the Lustrous Red Ware from Rangpur with similar goblets gains added significance. I believe that the influences which spread to the Narmada valley might have continued in wave after wave after the earlier waves reached Narmada. Other waves followed with slightly different pottery traditions and it is this that we find at Rangpur and other sites in Saurashtra like Somnath and elsewhere, and as far down at Piklihal in the Karnatak, along with the ground stone axes according to ALLCHIN.[349] Of course, the route to Maheswar has got to be searched for. It might have been along the lower courses of the Narmada or the Tapi from Saurashtra or did it follow the overland route from Rajputana, the Panjab, Baluchistan, Sind, Afghanistan etc. This again cannot be answered unless the vast intermediate areas are very carefully explored and some of them excavated.

Black-and-Red ware

Recently the black-and-red pottery has been found not only in some sites in northern India, but it occurs as far as Sonpur[350] in Bihar, in a context which seems to be definitely earlier than the occurrence of the NBP. In fact were we to put the occurrence of this ware in space and time, it will be found that it occurs almost throughout India in very early phases. Now what does this signify? Unless the absolute dates are known, we cannot say that this pottery went from the west to east and north to south; or the process was in a reverse direction, but it is a very interesting phenomenon and needs to be examined very, very carefully, before some deductions are made regarding its movement from north to south or from south to north.

347. What DANIEL calls "the application of historical names to archaeological groups in Europe." *A Hundred Years of Archaeology*, p. 149.

348. Very recently, when a symposium was held in London where so many international scholars gathered, one scholar expressed such views. Cf. *Historians of India, Pakistan and Ceylon*, Ed. by C. H. PHILIPS, London, 1961, p. 291. Such a view of the Puranas would have been justified, to some extent, when we had nothing to offer before 300 B.C. and 2500 B.C. The discovery of the Chalcolithic cultures has changed the position as did the discovery of the Indus Civilization 40 years go.

349. Cf. however, GORDON, D. H., *The Prehistoric Background of Indian Culture*, p. 149, who thought that it would provide a humorous aspect to the whole question, if the earliest Aryans had brought the polished axe.

350. Also spelt as Sonepur, but the former is more correct.

The black-and-red ware problem is not a simple problem of superficially comparing the types and the fabrics from different places. One has got to examine the pottery from various areas, very scientifically in the laboratory and to say whether the processes in detail are identical or do they differ in important matters. If we can answer this question, then half of the problem is solved.

Iron Age

Similarly the question of the occurrence of Iron in India. Iron no doubt occurs in the south in the megalithic tombs, whereas in the north it has recently occurred in the earliest levels of Ujjain, Alamgirpur and at Bahal in layers which are definitely before the NBP. But this stratigraphic occurrence is of relatively little importance, because the difference in age may be 50 or 200 years and when a close date is the requisite, such an evidence is of little use. What is therefore necessary is to obtain iron in well stratified areas and secondly to examine it in the laboratory and find out the nature of that iron and relate it to the iron found from different areas. Unless this is done, it is again wrong to go on asking about the introduction of iron in India and its migration from north to south or south to north. It is possible that there are independent sources and it was introduced at different times in India irrespective of diffusion from one area to another.

Significance

However, whatever be the exact date of introduction of iron in India and the origin of the black-and-red ware, one thing is certain that by about the 5th century B.C., both these dominate the field. Copper is used henceforward, but not for making tools and weapons; for utensils, ornaments and toilet articles it was still preferred. The story is different with the black-and-red ware. The earlier painted wares are ousted completely. Does this indicate a mere change in the taste of the people or an intentional elimination of the local, regional groups of peoples or tribes ? Can we call it a fusion of various cultures ? If so, was it forced or did this fusion evolve gradually ? Excavation of key sites in different parts of India should explain this phenomenon at a very crucial stage in Indian history and culture. Evidence from Nasik and Nevasa in Northern Maharashtra suggests a clear break between the Chalcolithic and the Early Historic. Data from other sites are eagerly awaited.

Horizontal Excavations

So far we have been discussing merely the problems of prehistoric archaeology. But the very urgent need is not a mere collection of tools of Stone Ages or of the Copper Age or the evidence of pottery types, but the study of man himself. What are the stages by which man progressed from barbarism to civilization ? This is a much larger question and can be answered only if we now embark upon what is called " horizontal " or " area " excavations. These alone will tell us in some details of the life of the man in the past. The era of vertical digging has played its part—a very notable one indeed—in Indian archaeology. It must now be followed by large scale excavations. These should be so planned that the origins of civilization in different parts of India can be understood and correlated.

APPENDIX A

Terraces at Poona (*See Fig. 128 and Pl. XXXV*)

It was mentioned before (pp. 75, 79 and Fig. 36, p. 80) while discussing the stratigraphical position of Series II or Middle Stone Age tools that these occur in a gravel and silt which lie, according to the writer's observation in several regions of India, against the older palaeolithic gravel and silt terrace. Further and indeed very convincing confirmation of this view is available on the right bank of the Mutha river at Poona. Here after the writer discovered the stratified section containing Early Stone Age tools in the olive-green pebble gravel capped by nearly 25 ft. of silt at the Bund Garden, the section was further traced downstream for nearly half a mile and more tools were obtained. His colleagues were asked to search for a similar tool section upstream on the Mutha. And a mile-long section was found by Shri S. N. Rajguru at Lakdi Pul in the heart of the old Poona. This section begins just behind the Alka Talkies and terminates at the Dhobi Ghat near the new township of Datta Wadi. Further, a broad terrace is seen on the opposite bank at Vithalwadi, as at Vite on the Pravara. At the Dhobi Ghat one finds two gravels and two silt deposits. The older gravel not only contains olive-green, large and small basalt and dolerite pebbles and tools, but it is weathered orange-red and is capped by a dark brown calcareous silt. This deposit was partly eroded subsequently and in the hollow so caused lies the younger gravel, characterized by cross bedding, chalcedony nodules, ashy colour, and is not well cemented. Further it is capped by a light brown silt. This is of very rare occurrence and is seen by the author at Kasord Nala, near Maheshwar and at Devkachar, near Narsimhapur and opposite the Sagauna Ghat on the Narmada (See Appendix B) only. Thus we have two definite terraces, an older one about 35 ft. high, and a younger one about 27 ft. high. A small patch of the younger terrace now remains. It is collapsing, as at the Hathi Well section at Nevasa. Traces of this second and younger terrace gravel alone have remained at Bel Pandhari and Kalegaon on the Godavari. A careful search, however, might reveal such sections elsewhere as well.

APPENDIX B

Sequence of Terraces and Lithic Industries on the Narmada and their Correlation with the Rest of India

(*Figs. 129-130 and Plate XXXVI and Table*)

From our previous observations at Maheshwar (above pp. 51 and 80) and the recent ones around Hoshangabad and Narsimhapur :

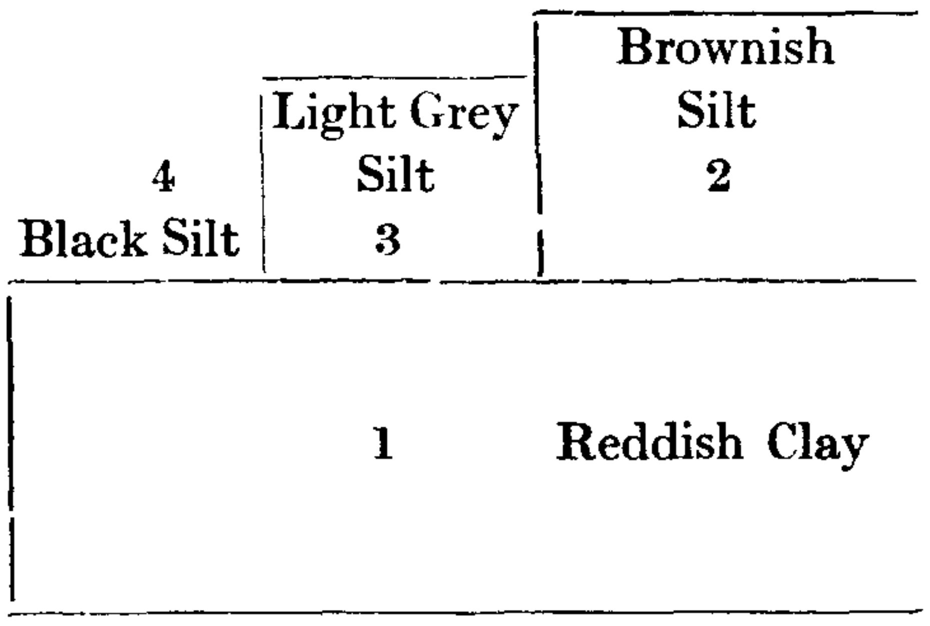
1. just near the Rest House and secondly below Girls' Training College,
2. Dongarwada,
3. Bandraban,
4. At Devkachar, about 7 miles from Narsimhapur, on the river Sedh (Sehr),

5. Sagauna Ghat on the confluence of the river Sedh, Varureva, Umar and the Narmada,
6. Barman Ghat, about 12 miles from Narsimhapur, on the Narmada,
7. Mahadeo Piparia,

it may now confidently be said that the sections given by De TERRA are reconstructions based on very careful observation. For nowhere a complete stratigraphical sequence seems to have been preserved as in the Mahismati Nala at Maheshwar. Thus at (*a*) Hoshangabad a pebble gravel is capped by a thick silt deposit, but at places it rests on a reddish (pinkish) concretionary clay. At locality (*b*) a thick—over 8 ft—wide terrace of pebble gravel is exposed. This seems to be the course basal gravel though at places it seems to have been overlaid by the second pebbly gravel.

Similar is the case at Dongarwada. But here further downwards towards Hasalpur the high silt cliff is eroded and filled in by blackish silt which forms a distinct low terrace. This phenomenon can be seen at Hoshangabad as well, but a little upstream beyond the temporary causeway.

At Devkachar the pebble-gravel is completely eroded and the new sandy chalcedony gravel rests directly over the reddish concretionary clay and is capped by a light grey silt which again shows up as a distinct terrace on the opposite bank. Its gravel is being eroded and lies loose in the bed and so a little to the right (as one descends) one may see only the four silts : the lowest reddish concretionary capped by a brownish one and forming the topmost terrace; the eroded portion of the latter covered by a light grey one, and where both these are removed, a blackish silt rests on the reddish silt. This may be shown thus :



Opposite the Sagauna Ghat, however, no earlier pebble gravels are exposed but on both the banks there is a thick—over 15 ft.—highly cemented gravel of trap and chalcedony, intercalated by yellowish sandy partings, resting over a laminated clay and capped by light grey silt. Here again this forms a distinct terrace, about 35-40 ft. in height, whereas the topmost is over 60 ft., and the youngest about 10-15 ft. This gravel contains Middle Stone Age (Series II) tools, rolled as well as fresh. There is no doubt that this is the principal horizon of these tools. It is also fossiliferous and where its silt-cover is thinner as one goes in the interior, a little away from the river, the fossils get ploughed up in fields on the Varurewa river, about a mile from Devkachar. (These incidentally are collected by the villagers and passed on to hurried "discoverers"

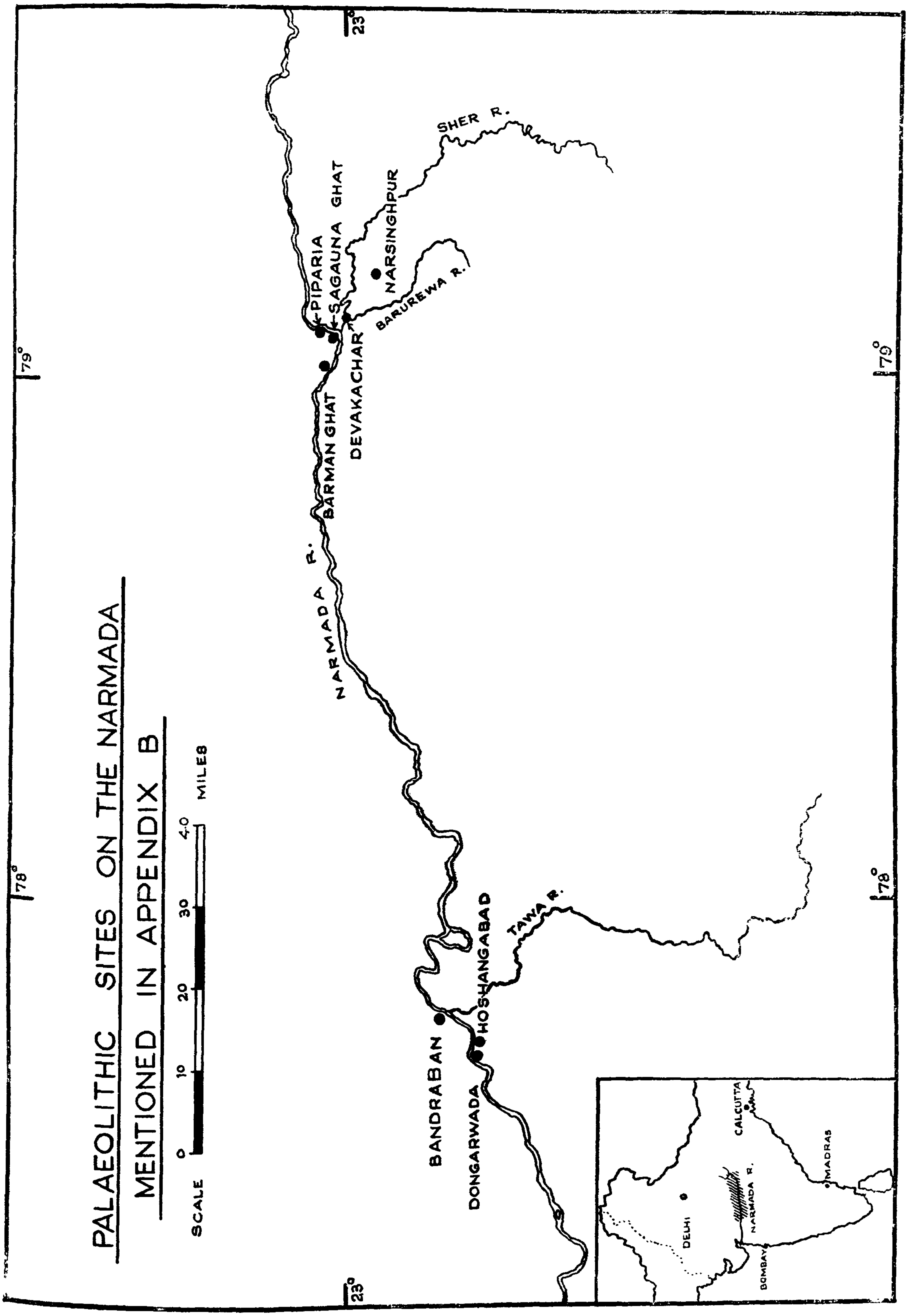

PALAEOLITHIC SITES ON THE NARMADA
MENTIONED IN APPENDIX B
SCALE
0
10
20
30
40
MILES
23°
78°
79°
NARMADA R.
SHER R.
BARUREWA R.
TAWA R.
PIPARIA
SAGAUNA GHAT
NARSINGHPUR
DEVAKACHAR
BARMAN GHAT
HOSHANGABAD
BANDRABAN
DONGARWADA
CALCUTTA
MADRAS
DELHI
NARMADA R.
BOMBAY

Fig. 130.

on payment. Otherwise it is not possible to collect a large number and that too big bones, in a brief visit. For it took us more than three hours to chisel out a shouldei blade from the cemented gravel at Sagauna Ghat).

At Barman Ghat again this gravel occurs and is being eroded. It is full of tools. But about half a mile upstream lies a greenish quartzite in the bed where one finds huge cores, flakes, and cleavers on side-flakes and occasional handaxes, all made on the spot, indicating that this was a factory site of the Early Stone Age man. Similar seems to be the case at Bandraban, where a brownish quartzite lies athwart the bed.

Thus the stratigraphy on this part of the Narmada and its tributaries conforms very well with our observations at Maheshwar. If somewhere, for instance near the Girls' Training College at Hoshangabad, or at Mahadev Piparia, the earliest coarse or pebble gravel is *isolated* and if this yields on a *careful digging* early Abbevillian types of handaxes, and high-angled flakes and the second pebble gravel these as well as Acheulian handaxes and cleavers, then we may propose the following stratigraphical and tool sequence on the Narmada.

V Chalcolithic Blade Industry

IV Black soil—Microliths as at Adamgarh

III { (*f*) Light Grey Silt
(*e*) Chalcedony Gravel—Middle Stone Age Tools[1]

II { (*d*) Brownish Silt
(*c*) Pebble Gravel—Acheulian Handaxes

I { (*b*) Reddish Concretionary Silt
(*a*) Basal Gravel[2]—Clactonian Flakes and Abbevillian Handaxes.

Thus Narmada alone and possibly Vaddamadurai on the Kortalyar may give us the earliest handaxe industry in India.

This Narmada sequence may be correlated withother regions as shown on p. 287.

1. Though it has been said by KHATRI and others that Series II tools are found in Gravel II, still it appears that these are very likely a washed out material. For we also found a large scraper superficially embedded in a pebble gravel at Hoshangabad.

2. No reference is made here to the occurrence of laterite which has been discussed by De TERRA, *op. cit.*, p. and KHATRI, A. P., "Stone Age——Narmada Valley", *Anthropos*, Vol. 56, 1961, p. 521. For none, except eroded blocks at Dongarwada, was noticed by us.

	NARMADA		GUJARAT		OTHER PARTS OF INDIA									
	Stratigraphy	Sequence of Lithic Industries	Sabarmati	Saurashtra	Maharashtra	Mysore	Andhra	Madras	Orissa	Bihar–W. Bengal	Panjab (E.W.)	Uttar Pradesh	Madhya Pradesh (excluding Narmada)	Rajasthan
V	Black Soil or Yellow Silt	Neolithic-Chalcolithic	X	V	V	V	V (West)	?	?	?	V	V (?)	V	V
IV	Black Silt	Microliths	Langhnaj	IV	IV (Surface)	Surface (caves)	Surface (caves)	Surface and Teris	Surface	Birbhanpur	IV (?)	IV (Caves & rockshelters)	IV	IV
III	Trap and Chalcedony Gravel	Middle Stone Age	Not Known	III	III	III	III	III	III	III	III	III Rewa & Mirzapur	III	III
II	Pebble Gravel	Acheulian	II	II	II	II	II	II	II	II	II	II	II	II
I	Basal Pebble Gravel	Abbevillian	—	X	X	X	X	I (?)	X	X	I	X	X	X

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An exhaustive bibliography is being prepared. Meanwhile only the most important articles and books are listed here. This list has been prepared with the assistance of Dr. V. N. MISRA, Lecturer in Prehistory, University of Poona. I am thankful to Dr. MISRA for his assistance.

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ABBREVIATIONS

Am. Anth *American Anthropologist*
AI *Ancient India*
ARASI *Annual Report of the Archaeological Survey of India*
Art. As *Artibus Asiae*
BDCRI *Bulletin of the Deccan College Research Institute*, Poona
Bhar. Vidya *Bharatiya Vidya*
BISMQ *Bharat Itihas Samshodhak Mandal Quarterly*, Poona
BG or *Bomb. Gaz.* *Bombay Gazetteer*
BLU or *BLUIA* *Bulletin of the London University Institute of Archaeology*
BNISI *Bulletin National Institute of Sciences in India*, New Delhi
BSOAS *Bulletin of the School of Oriental and African Studies*, London
EA *Eastern Anthropologist*
Geog. Jour *The Geographical Journal*, London
IA *Indian Antiquary*
IAR *Indian Archaeology—A Review*
ILN *Illustrated London News*, London
JAI *Journal Anthropological Institute*, London
JAS Bombay *Journal of the Asiatic Society*, Bombay
JASB *Journal of the Asiatic Society of Bengal*, Calcutta
JBBRAS *Journal of the Bombay Branch Royal Asiatic Society*, Bombay
JBRS *Journal of Bihar Research Society*
JGRS *Journal Gujarat Research Society*, Bombay
JISOA *Journal of the Indian Society of Oriental Art*
JMSUB *Journal Maharaja Sayajirao University of Baroda*, Baroda
JPASI *Journal Palaeontological Society of India*, Lucknow
JRAI *Journal Royal Anthropological Institute*, London
JOI *Journal of Oriental Institute*, Baroda
JRASB *Journal of the Royal Asiatic Society of Bengal*, Calcutta
JUB *Journal of the University of Bombay*, Bombay
JWH *Journal of World History*
MASI *Memoir of the Archaeological Survey of India*
MCAS *Memoir of the Connecticut Academy of Science and Art*
MGSI *Memoir Geological Survey of India*
MJLS *Madras Journal of Literature and Science*, Madras
MI *Man in India*
NIA *The New Indian Antiquary*
PAPS *Proceedings of the American Philosophical Society*
PASB *Proceedings of the Asiatic Society of Bengal*, Calcutta
PPS *Proceedings of the Prehistoric Society*, Cambridge
PISC *Proceedings of the Indian Science Congress*
RBAAS *Records of the British Association for the Advancement of Science*
RGSI *Records of the Geological Survey of India*
Sci. Cult *Science and Culture*
SAAB *South African Archaeological Bulletin*
TAPS *Transactions of the American Philosophical Society*

INDEX

In the preparation of the Index, I have been assisted by my pupils, particularly Shri K. P. Nautiyal and Shri M. S. Nagaraja Rao. The former prepared the card index from the text marked by me and later both of them and four others classified the cards alphabetically. These were written down by me ; so for any mistake of commission and omission, I alone am responsible.

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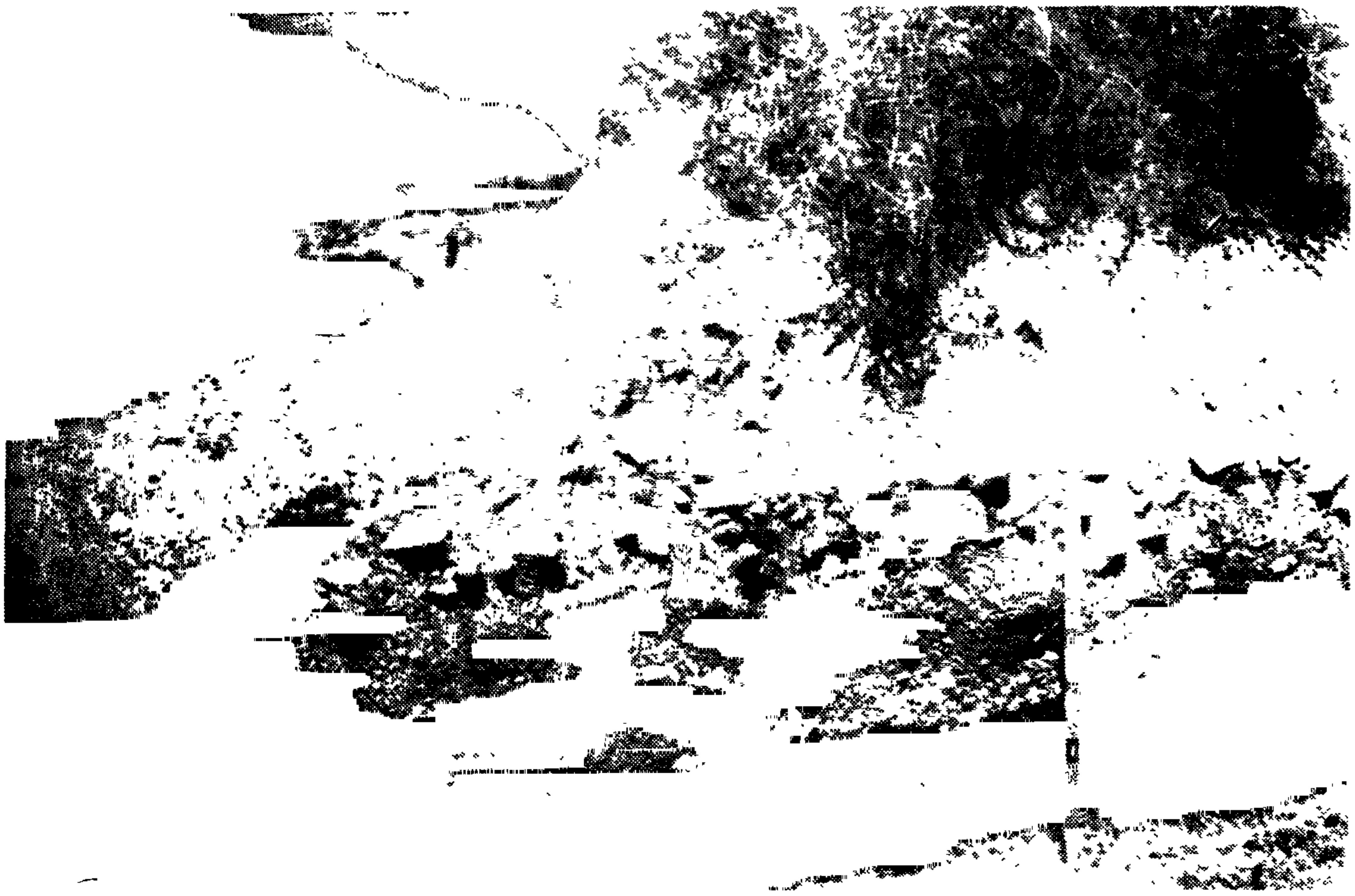


Fig. 17—(*a*) Eroded laterite plain at Krishnapuram on the Bhavanasi, Kurnool Dist.

(*b*) Section cliff, left bank, Bhavanasi showing indurated silt capped by brownish silt. The lower implimentiferous gravel is not visible in the photo.

Fig. 31. Pyriform Handaxe from Nevasa.

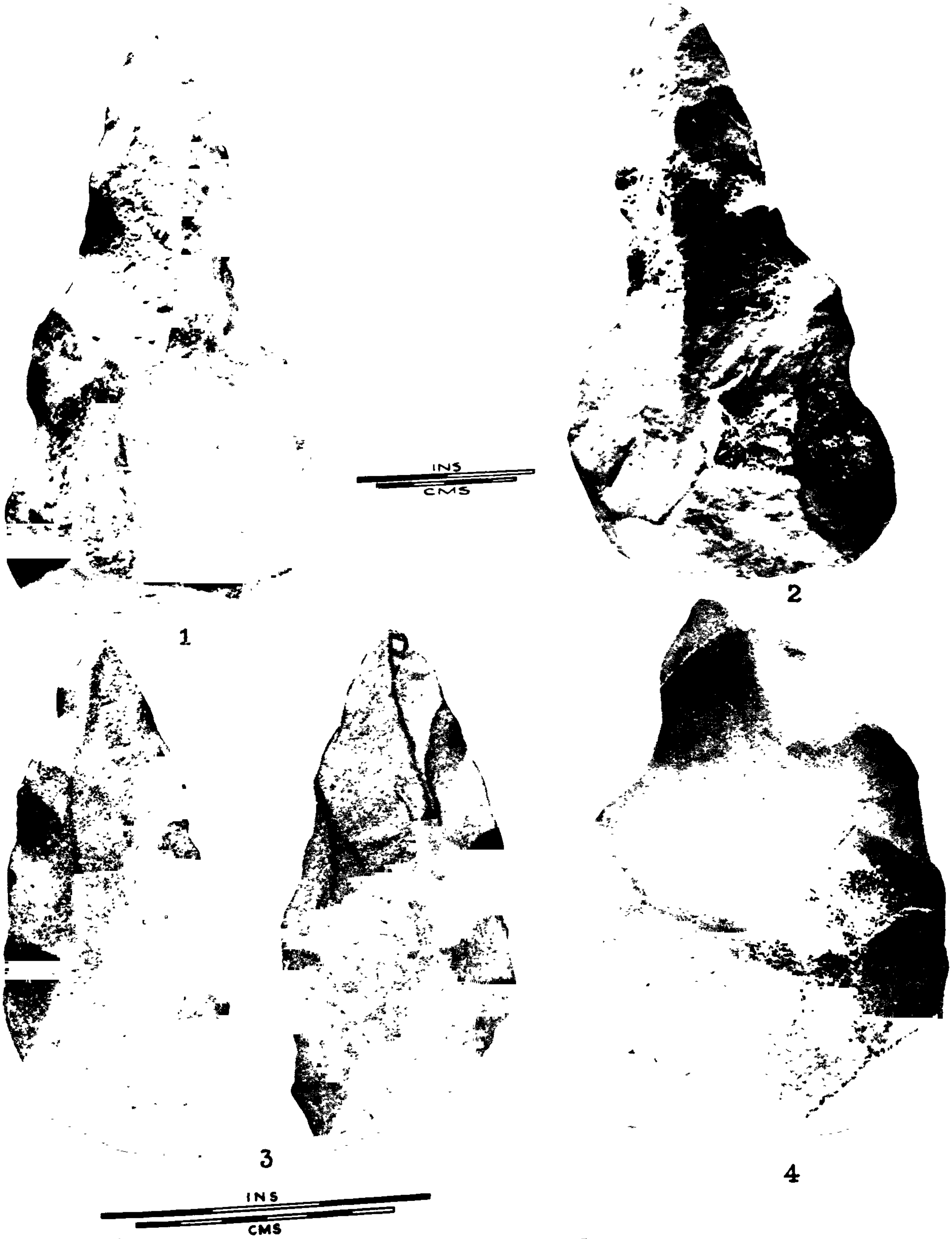


Fig. 32. Handaxes from Nevasa.

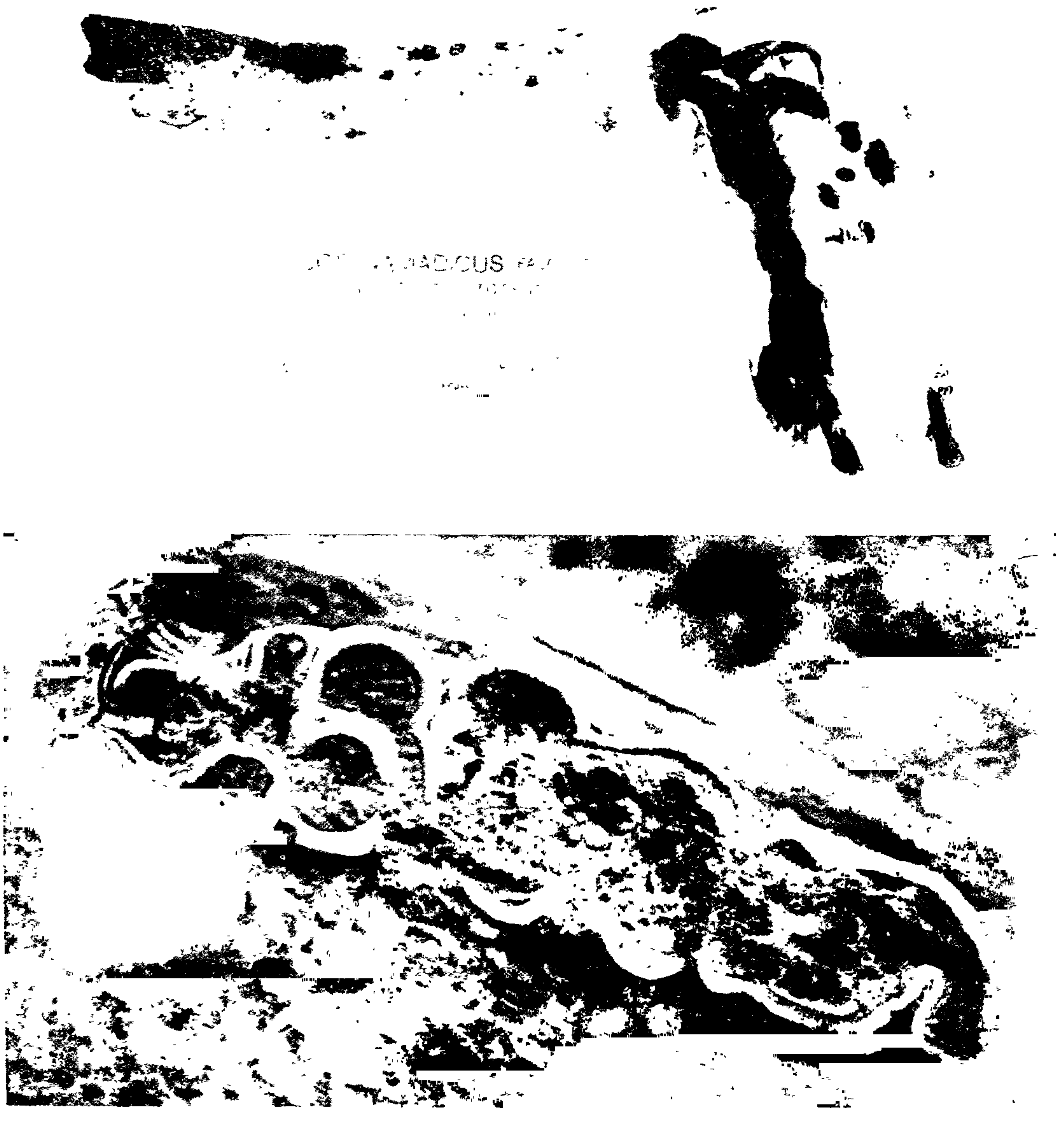
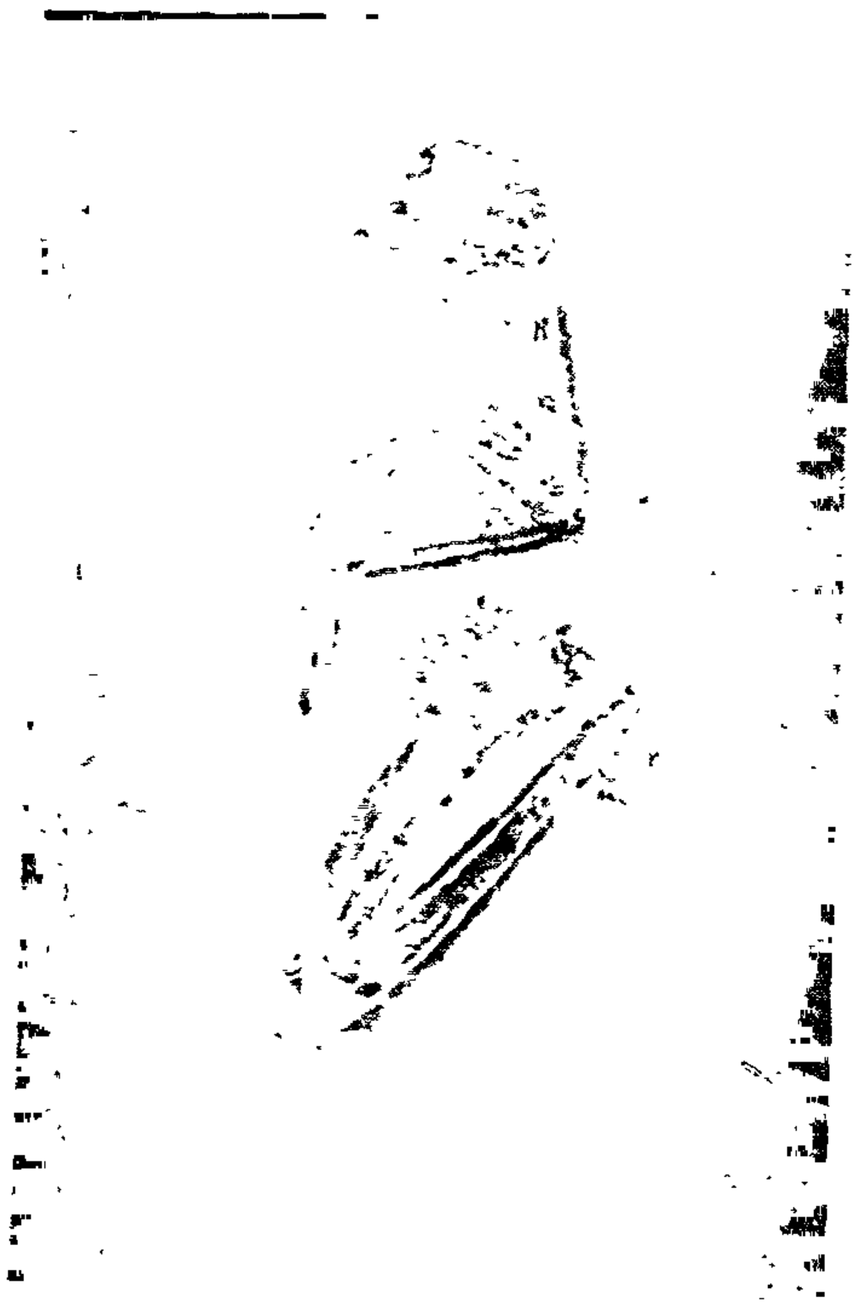


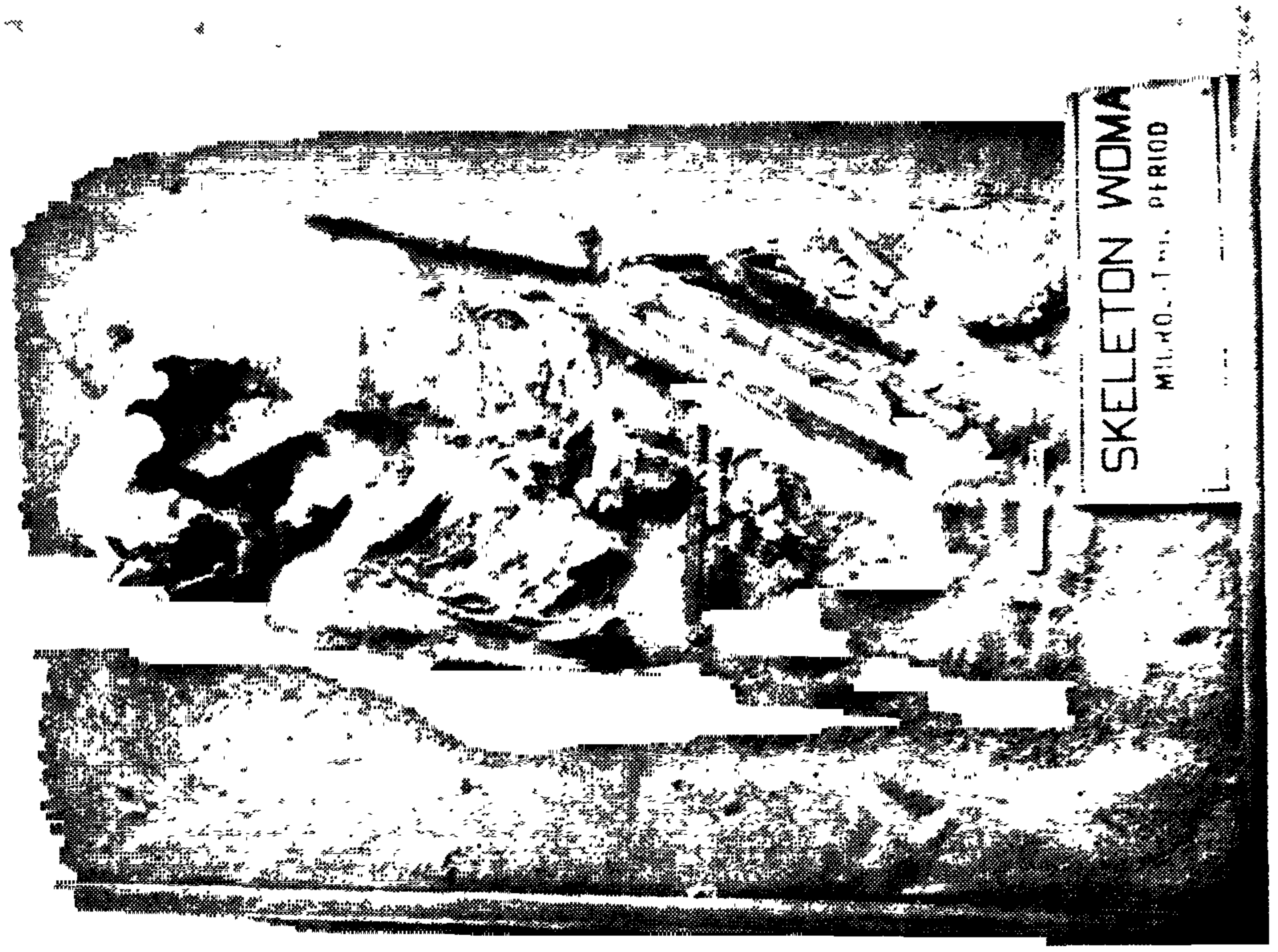
Fig. 35. (*a*) Jaw of *Bos namadicus*, from Nevasa.
(*b*) Skull (with horn) of *Bos namadicus* from Kalegaon.

Fig. 63. (*a*) Human skeleton and section of a trench at Langhnaj.



(*b*) Human skeleton Langhnaj.

(a)



(b)

Fig. 64—Skeletons of (*a*) man and (*b*) woman, Langhnaj.

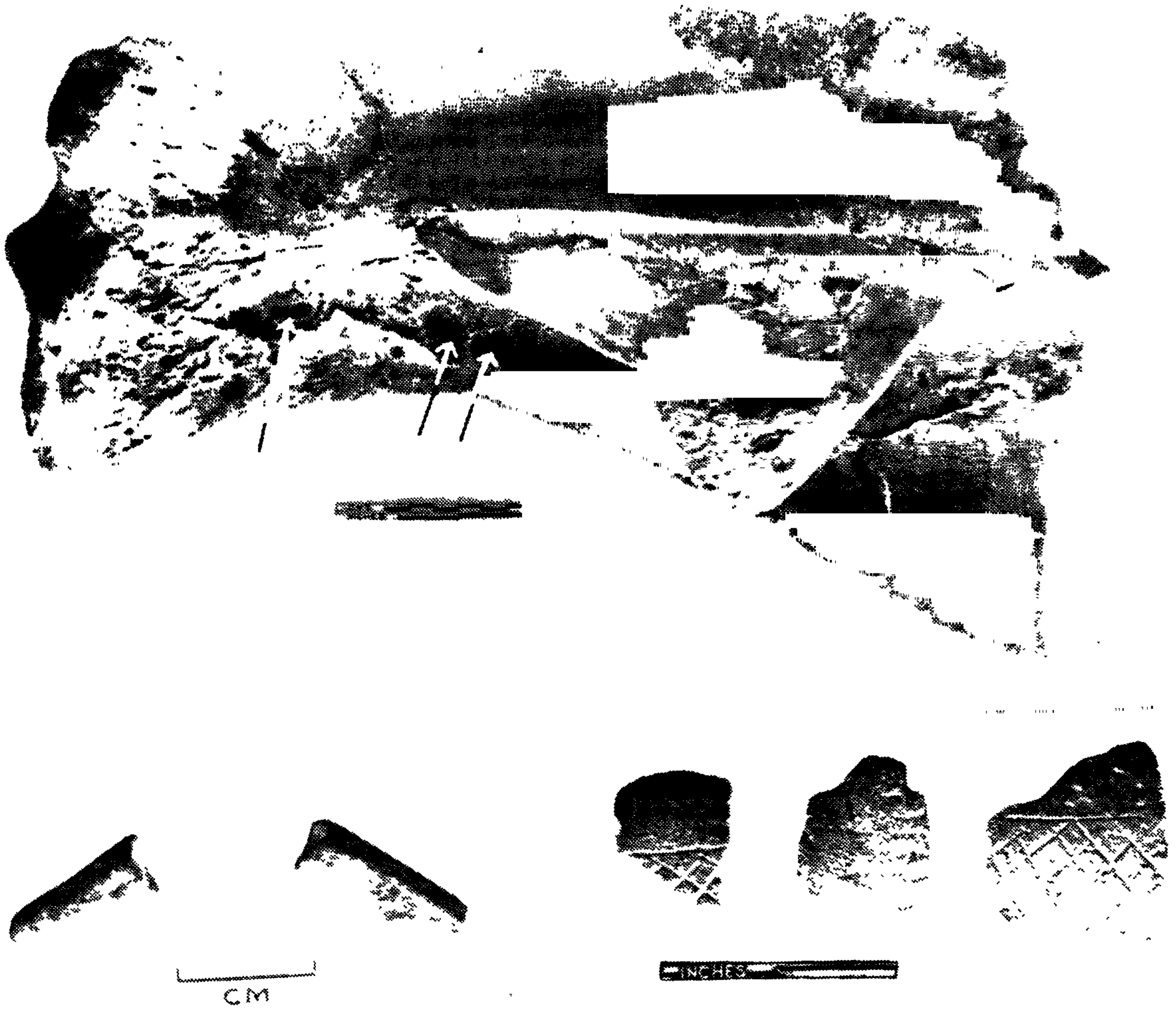


Fig. 65. Rhinoceros shoulder blade, Dentalium shell beads and potsherds, Langhnaj, N. Gujarat.

Fig. 68. The "Dockyard," Lothal, Gujarat.

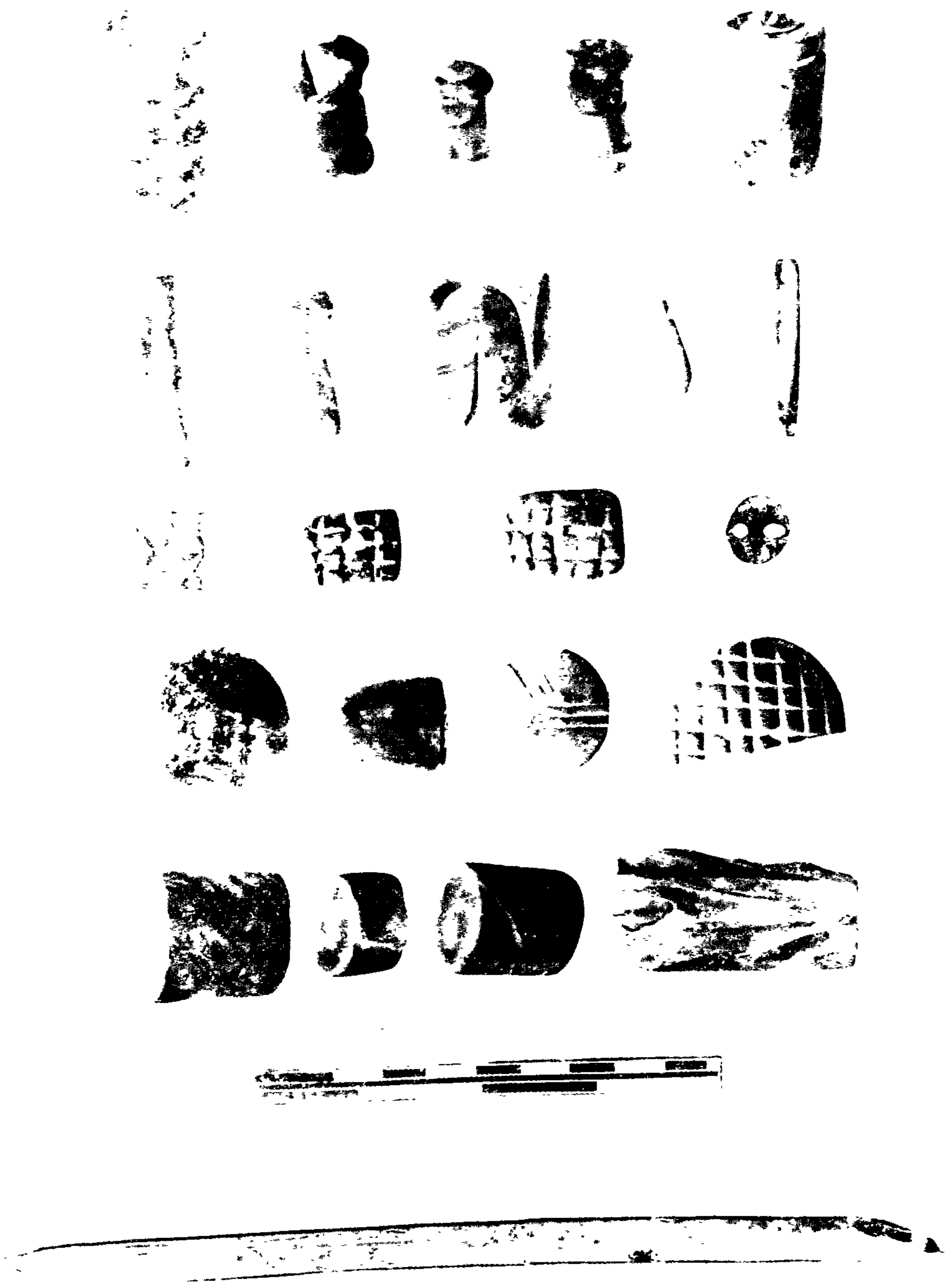
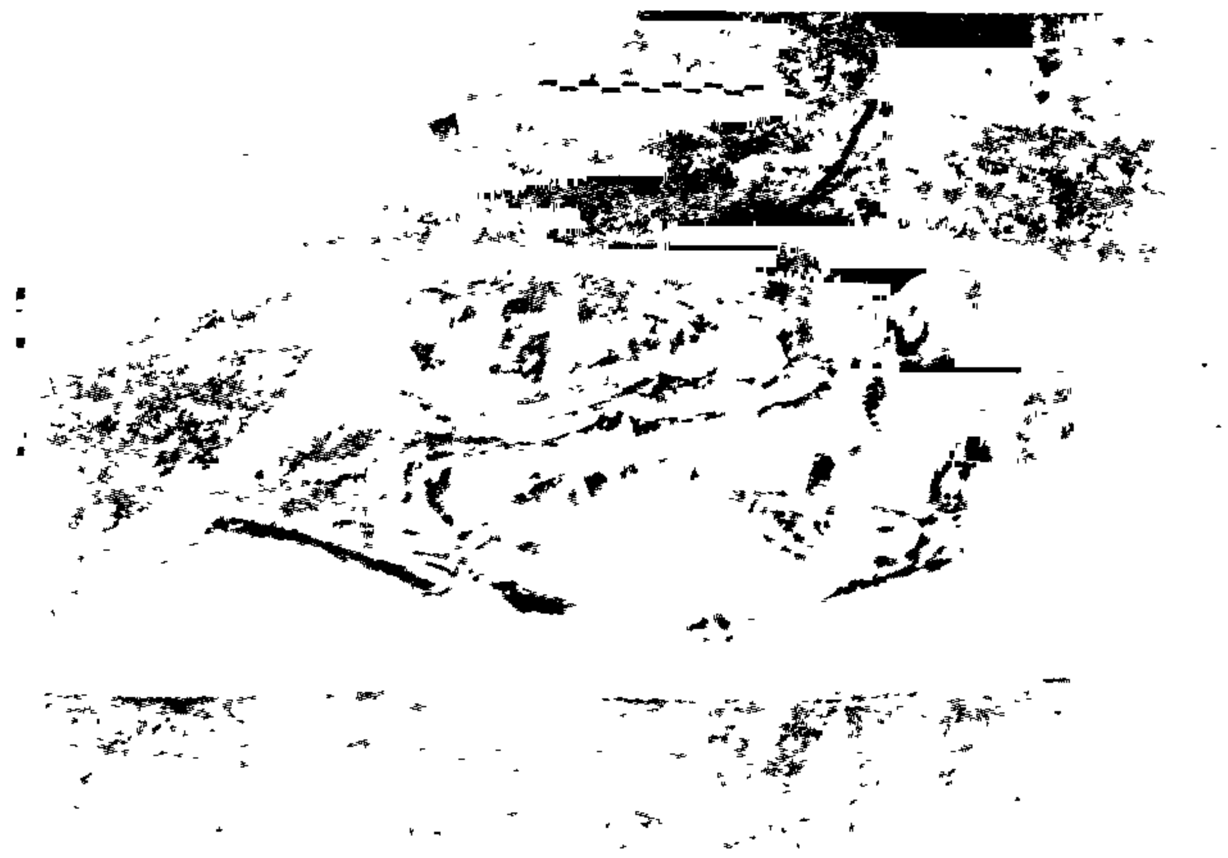


Fig. 68A. (*a*) Compass (Second row, centre, from above) and other objects from Lothal.
(*b*) Ivory scale, Lothal.

(*a*)

(*b*)



(*c*)

(*d*)

Fig. 69.

(*a*) Terracotta horse or horse-like animal, Lothal

(*b*) Typical Harappan Pottery

(*c*) Double Burial, Lothal.

(*d*) Typical Pottery, Period B. Lothal.

(*a*) Floors with terracotta nodules at Kalibanga.

Fig. 70A. (*b*) Mud-brick walls at Kalibanga, N. Rajasthan.

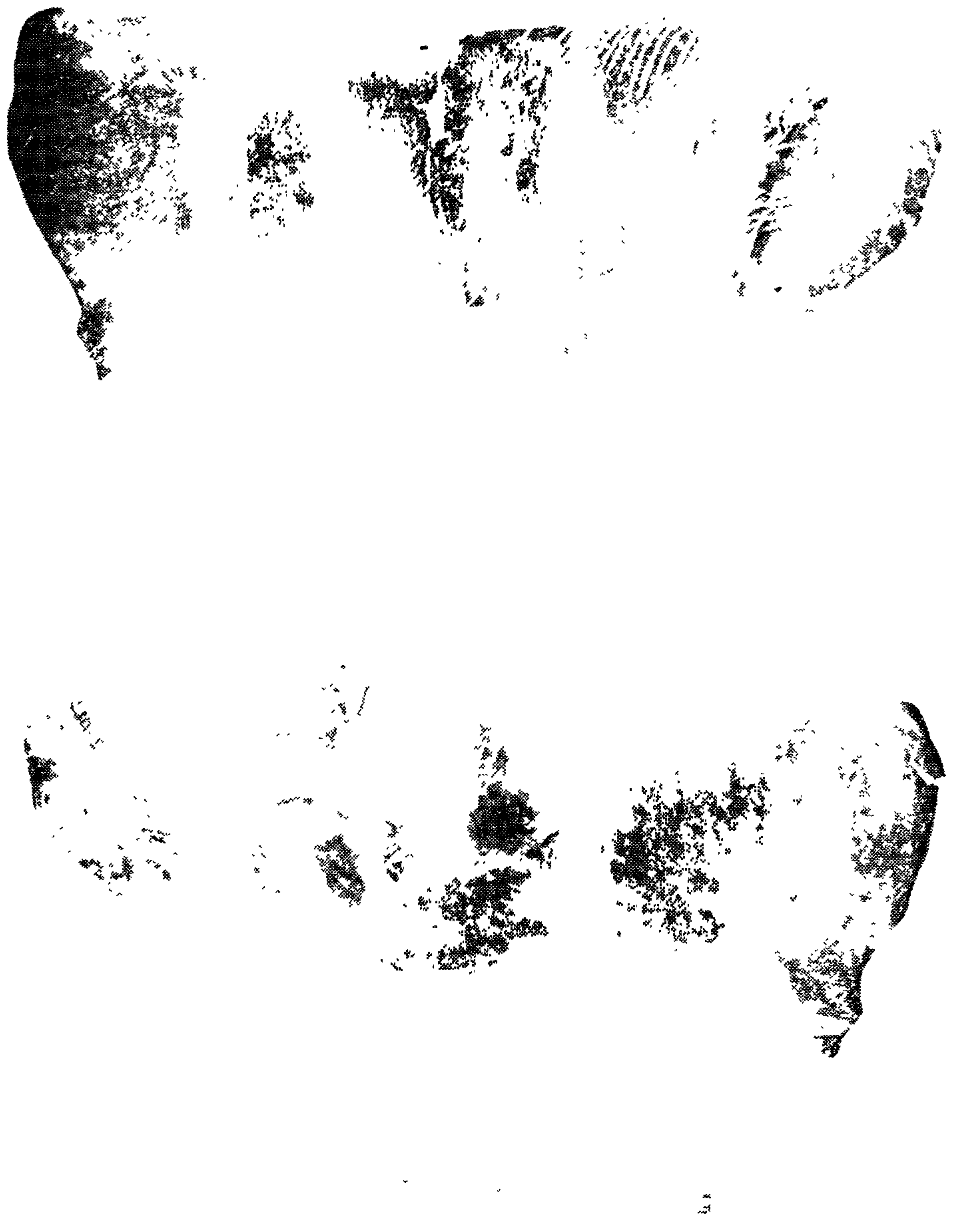


Fig. 70 (*c*) Terracotta Bull from Kalibangan.

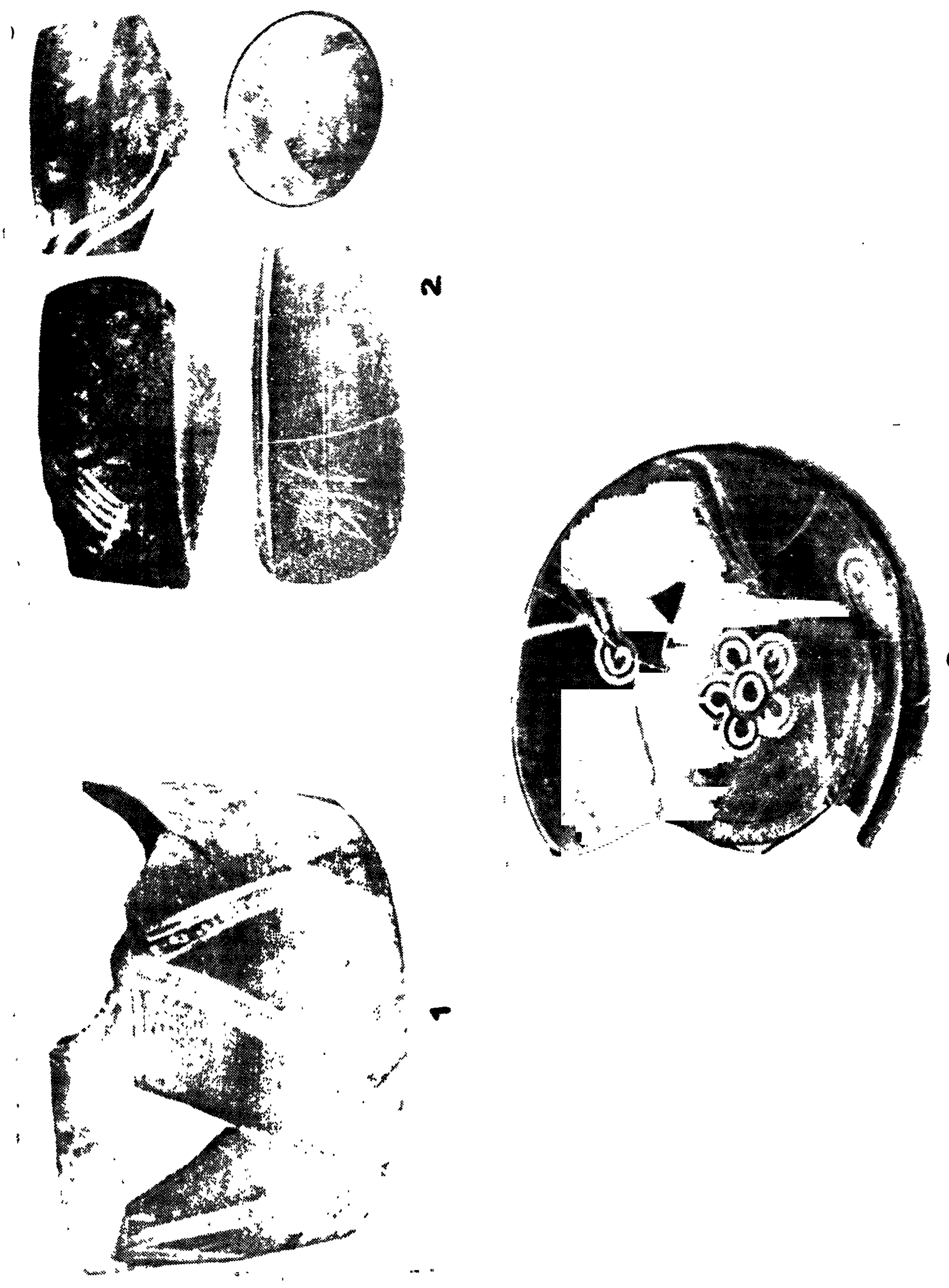


Fig. 73. Bowls and Dishes in Painted Grey Ware.

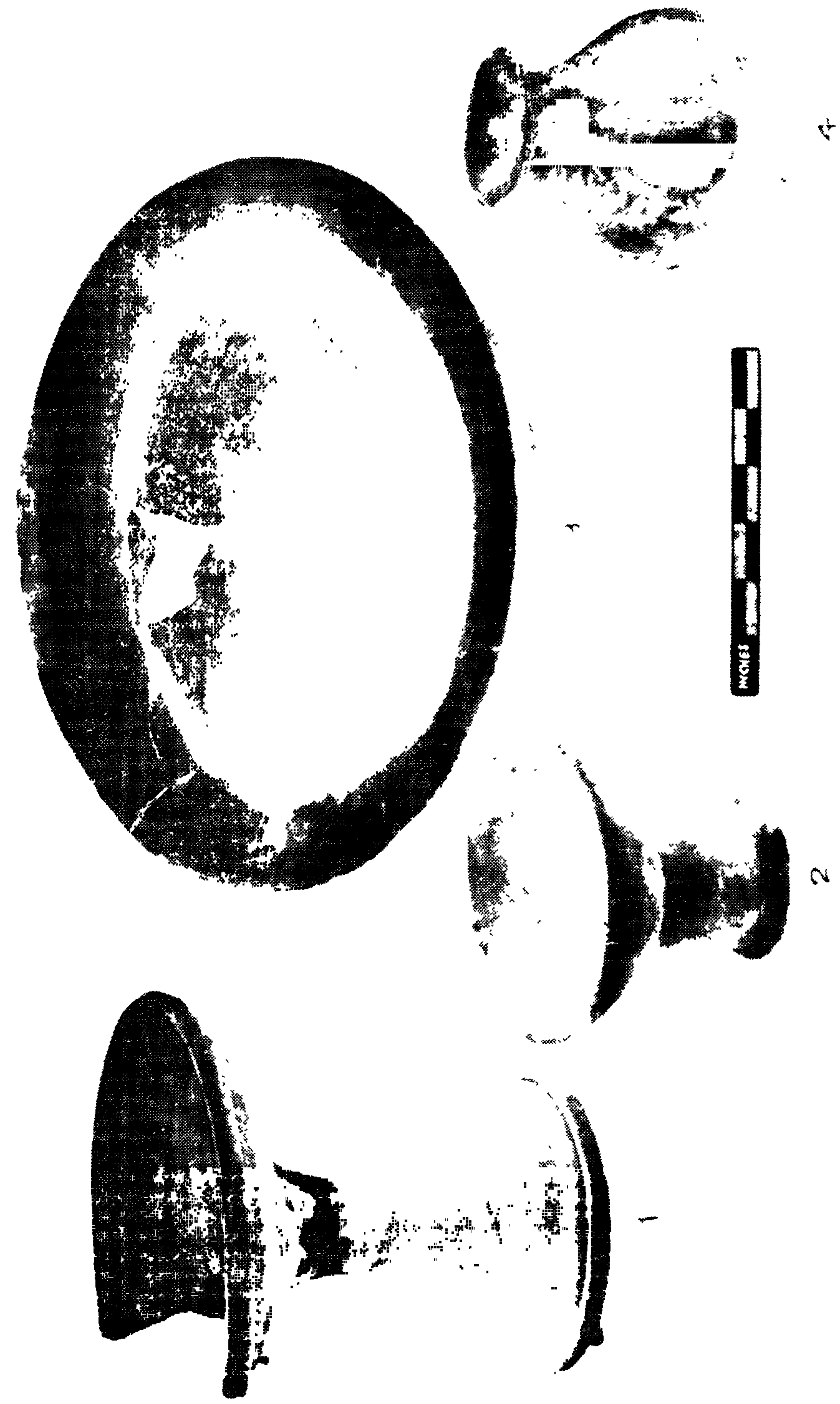


Fig. 74A. Pottery from Ahar, Udaipur, 2, 3, 4 (Period *Ia*), 1 (Period *Ic*).

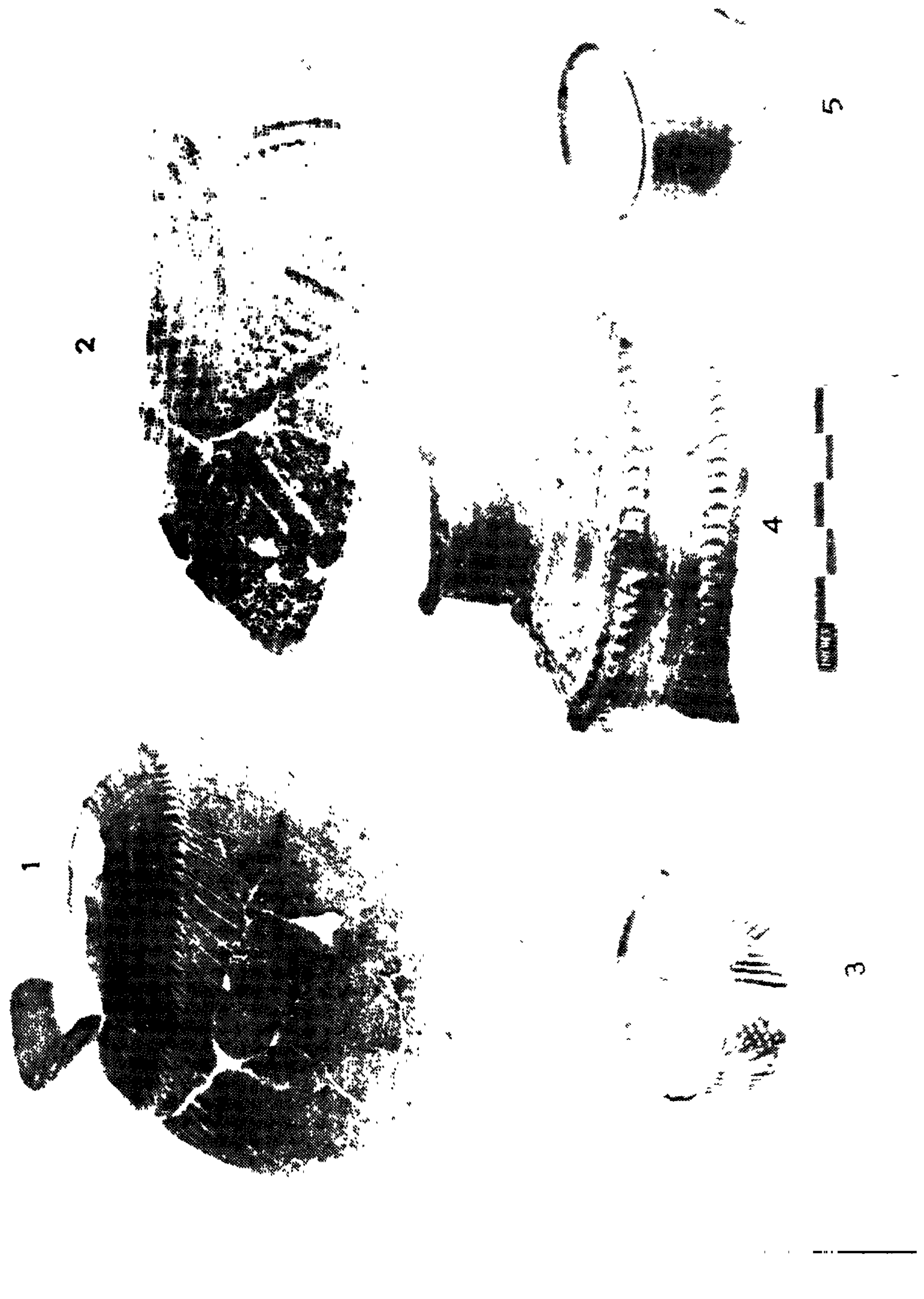


Fig. 74B. Pottery from Ahar, Udaipur, 1, 2, 4 incised, cut and applique Ware; 3, 5 black-and-red Ware (All Period *I*).

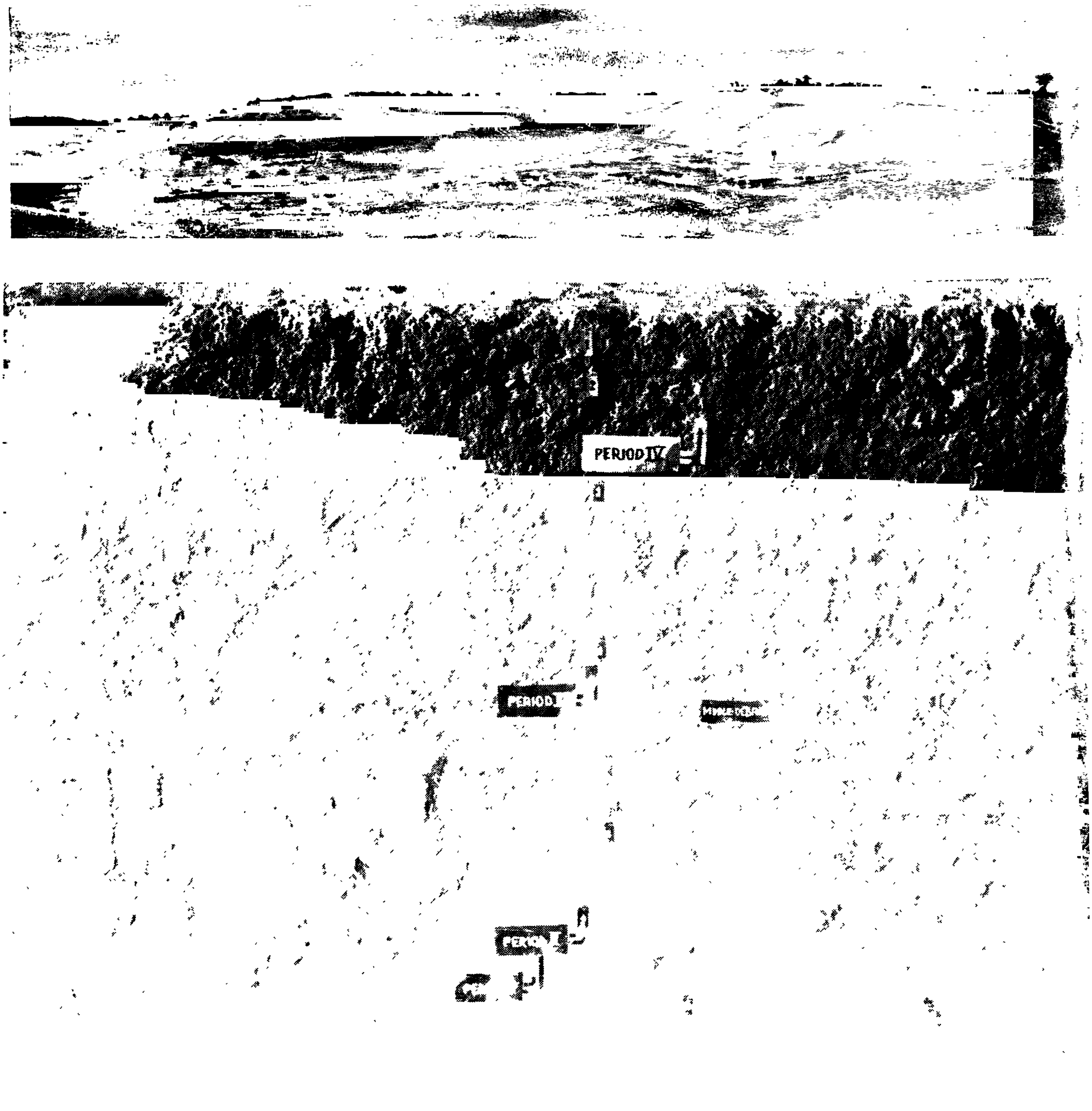
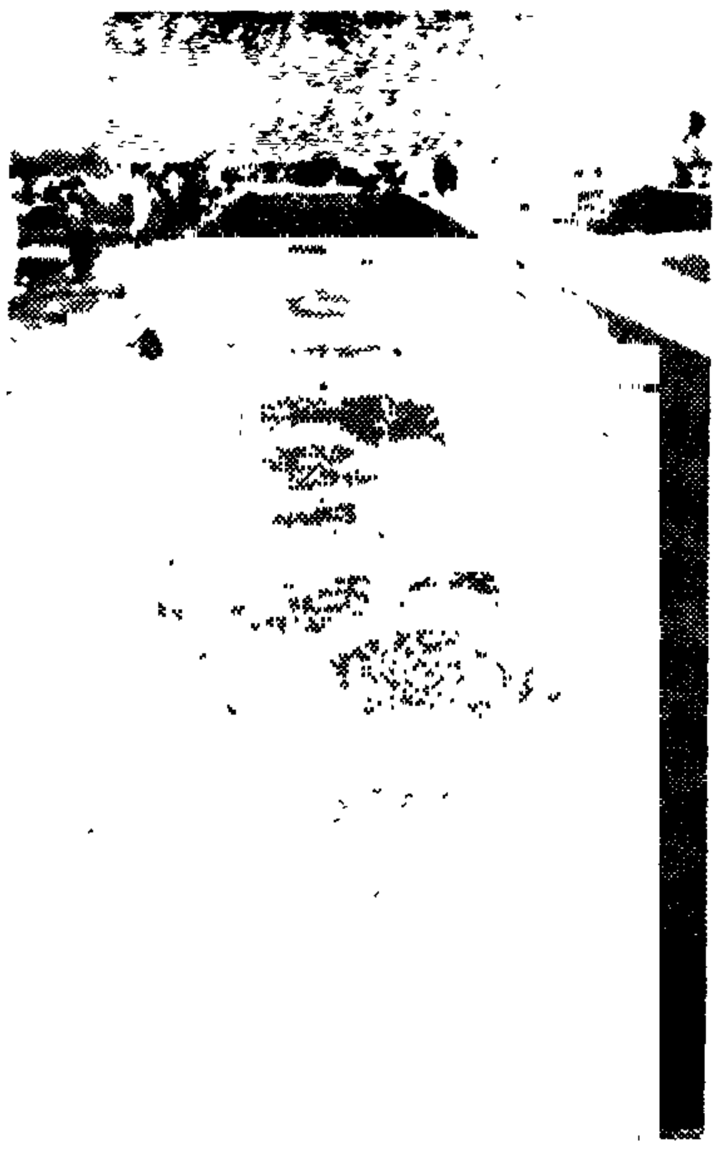
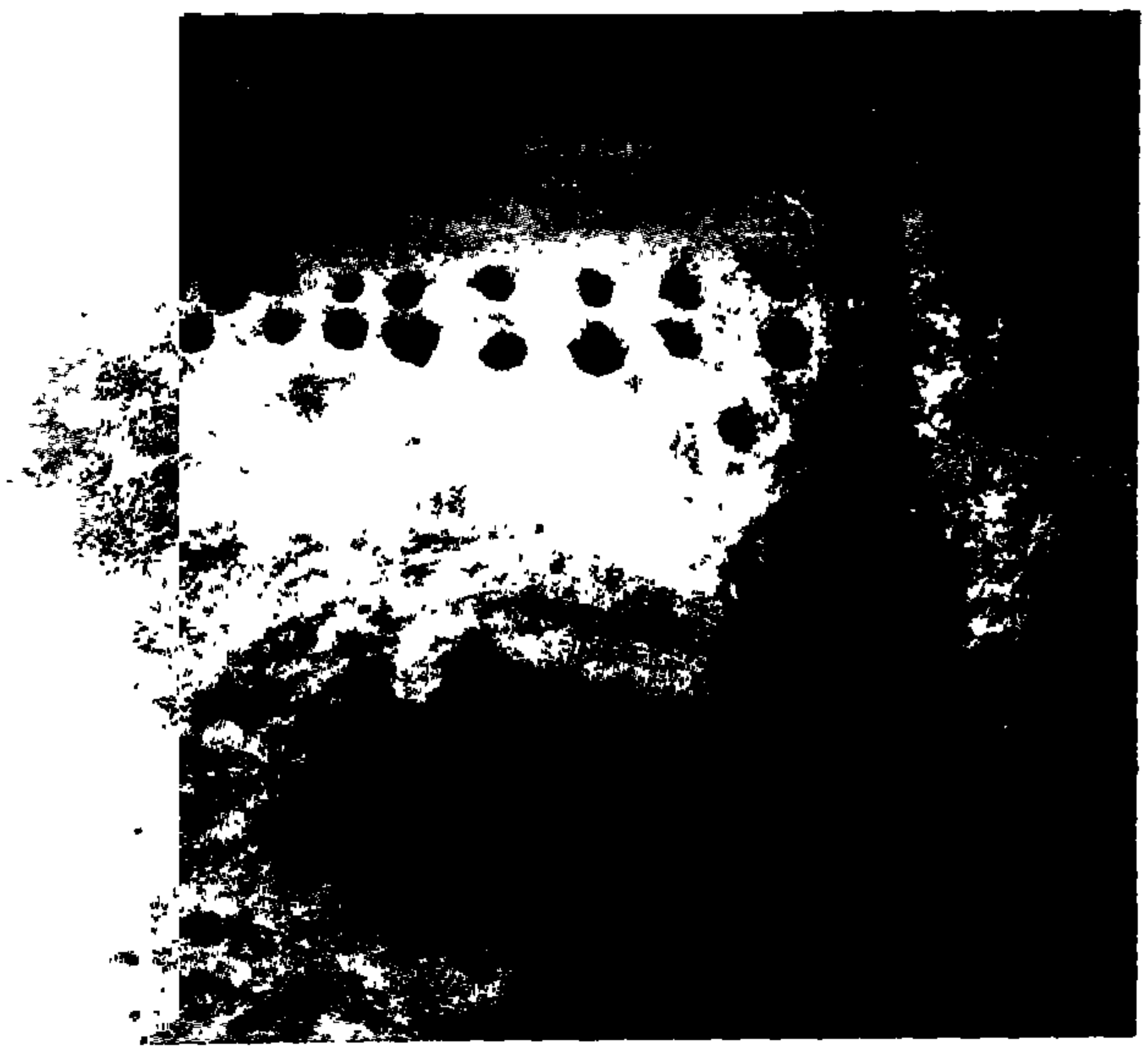


Fig. 77 (*a*) View of Mound IV.

(*b*) Section showing debris of four periods at Navdatoli, Madhya Pradesh.





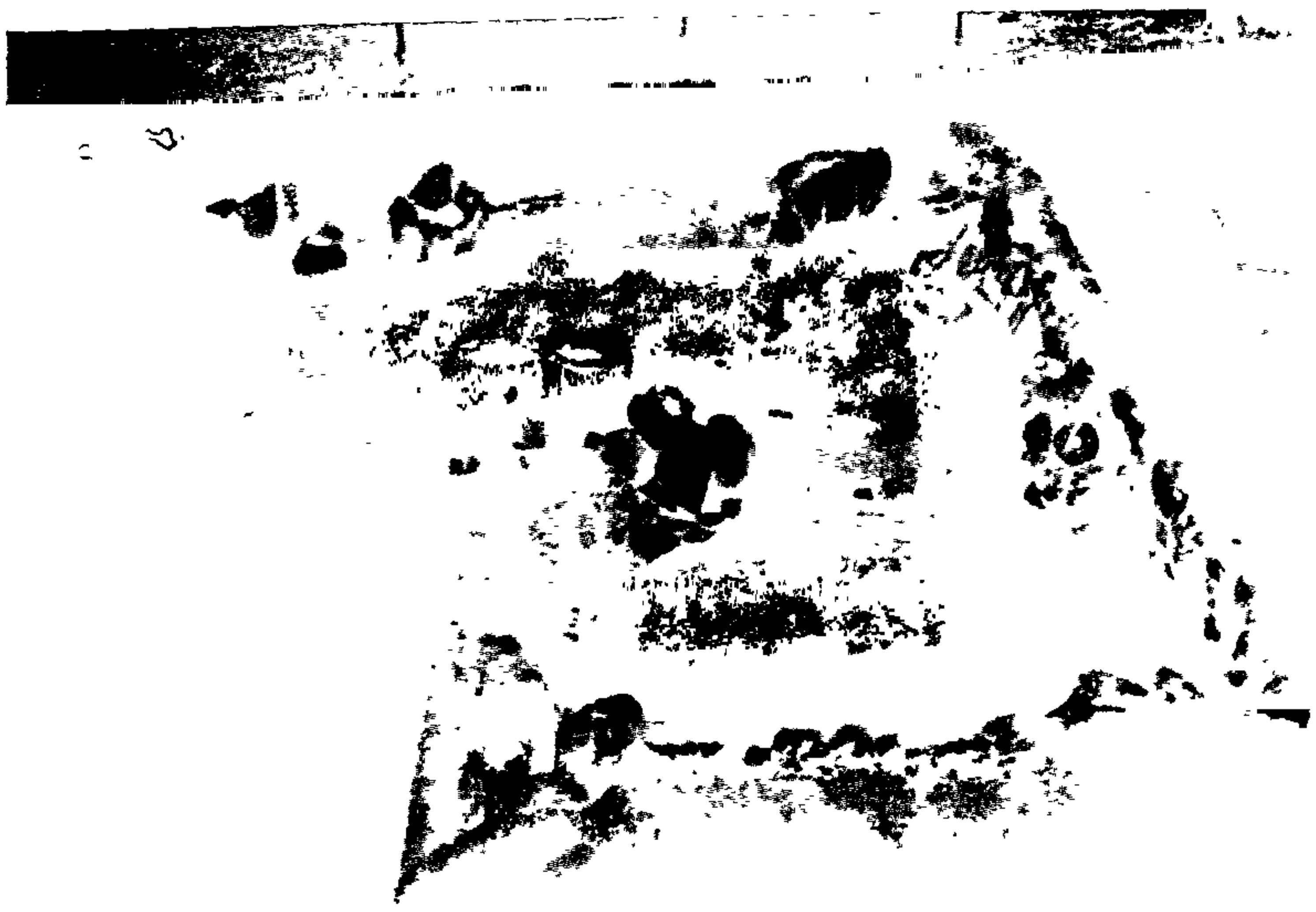


Fig. 78

(*a*) Remains of circular structures.

(*b*) A "room" outlined by charred wooden posts.

(*c*) A row of double post-holes.

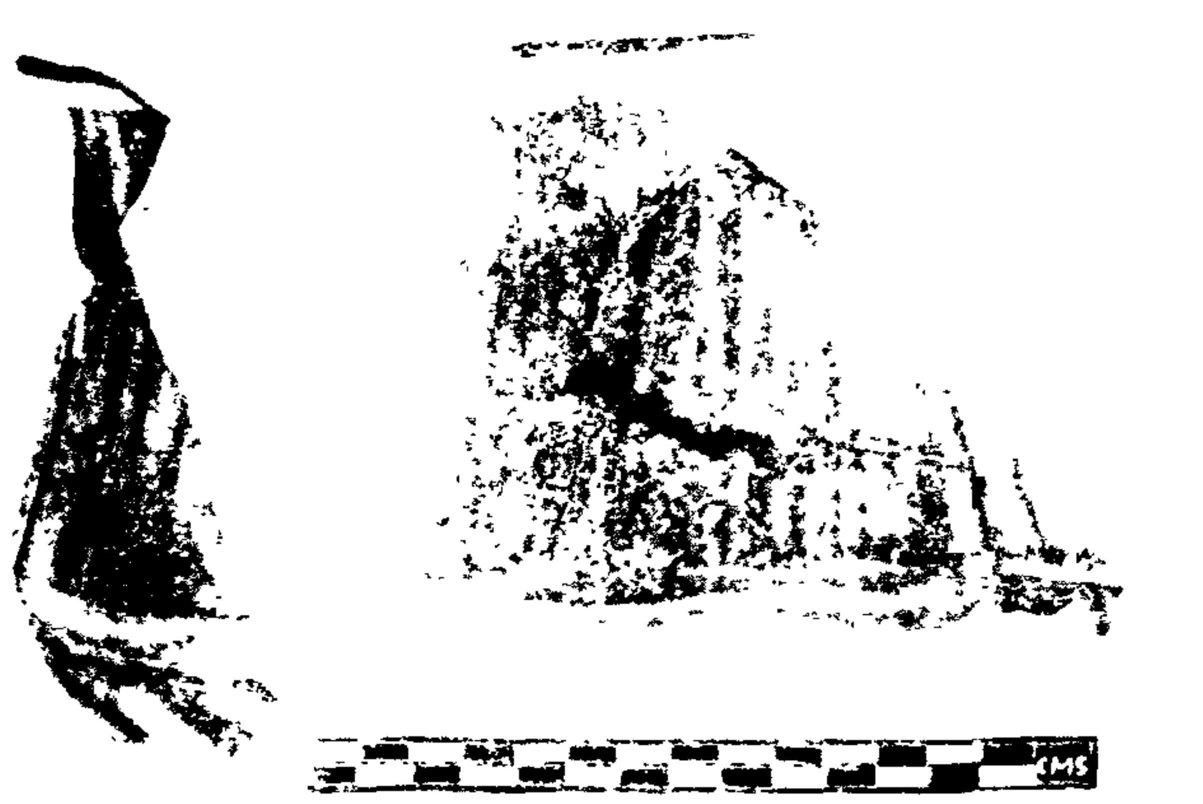
(*d*) Remains of a mud-walled house, Phase IV, Navdatoli.

Fig. 79

(*a-b*) Kuja-like high, narrow-necked vessels,

(*c*) Large, painted jar,

(*d*) Carinated bowl, Phase I, Navdatoli.



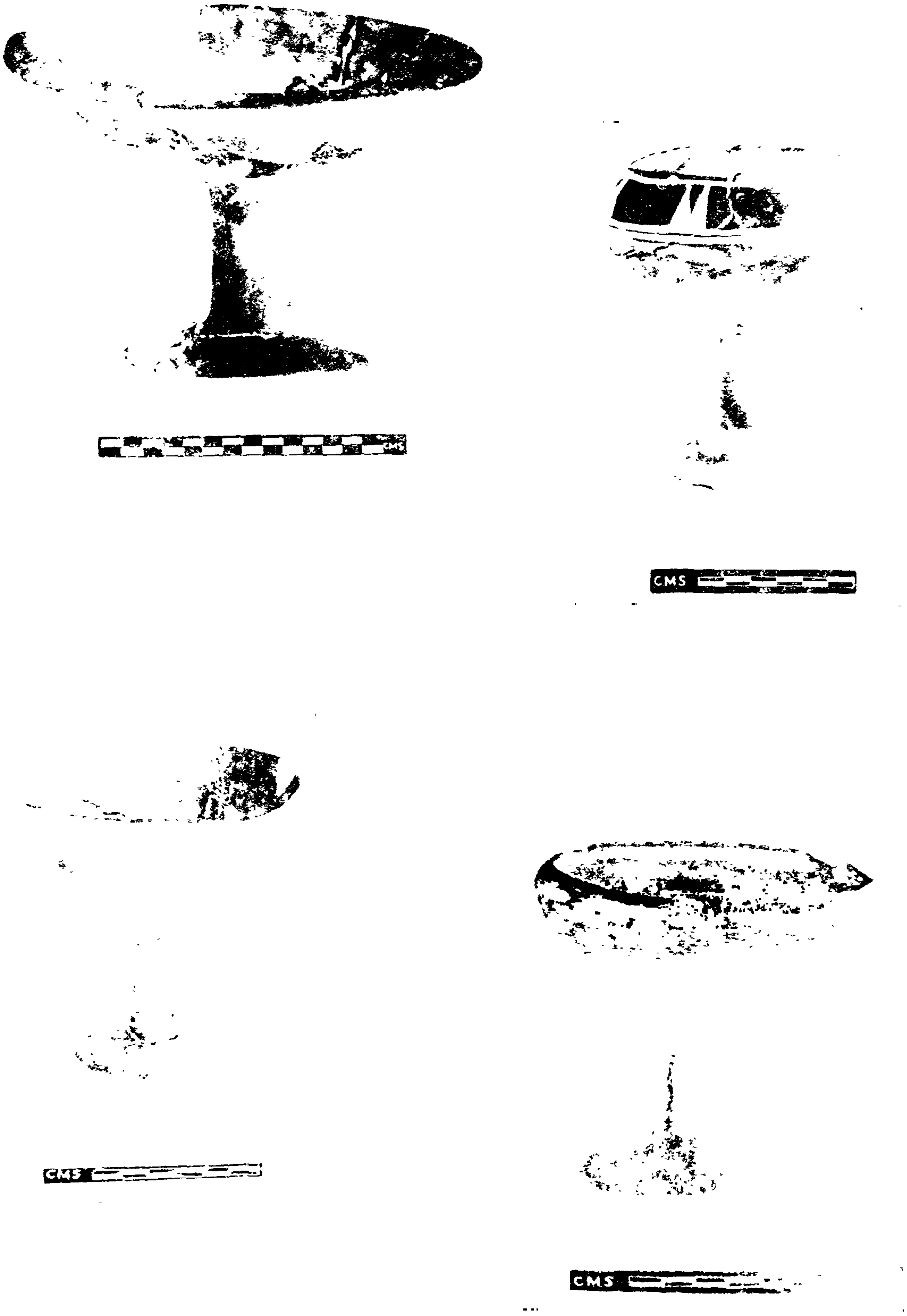


Fig. 80. Dish-on-stand and Goblets, Periods II and III, Navdatoli.

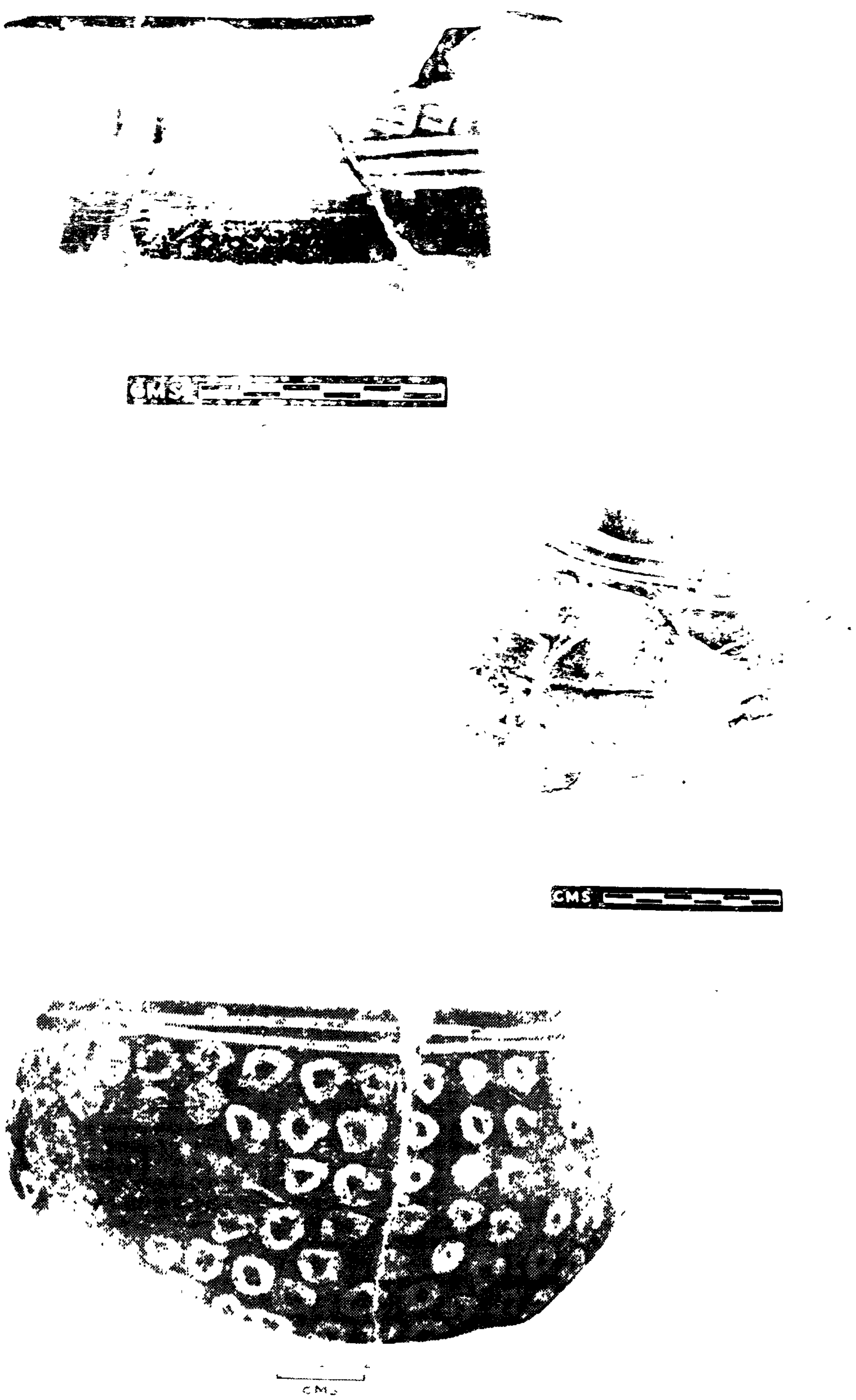


Fig. 81. White-slipped Pottery: (*a*, *c*) bowls, (*b*) Shoulder portion of a jar, Periods I-II, Navdatoli.

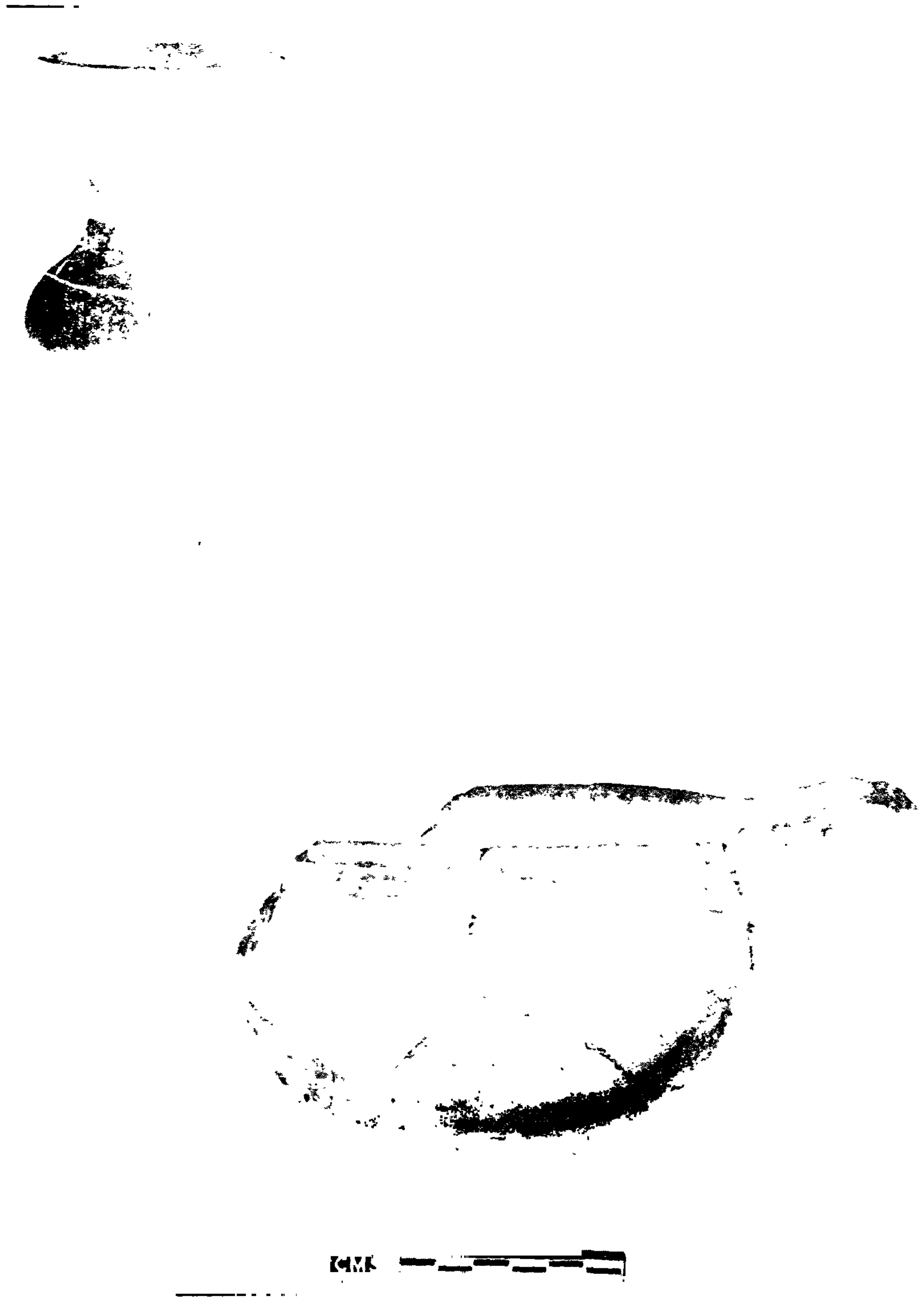


Fig. 82

(*a*) Lota (Water-pot).

(*b*) Channel-spouted bowl. Period IV, Navdatoli.

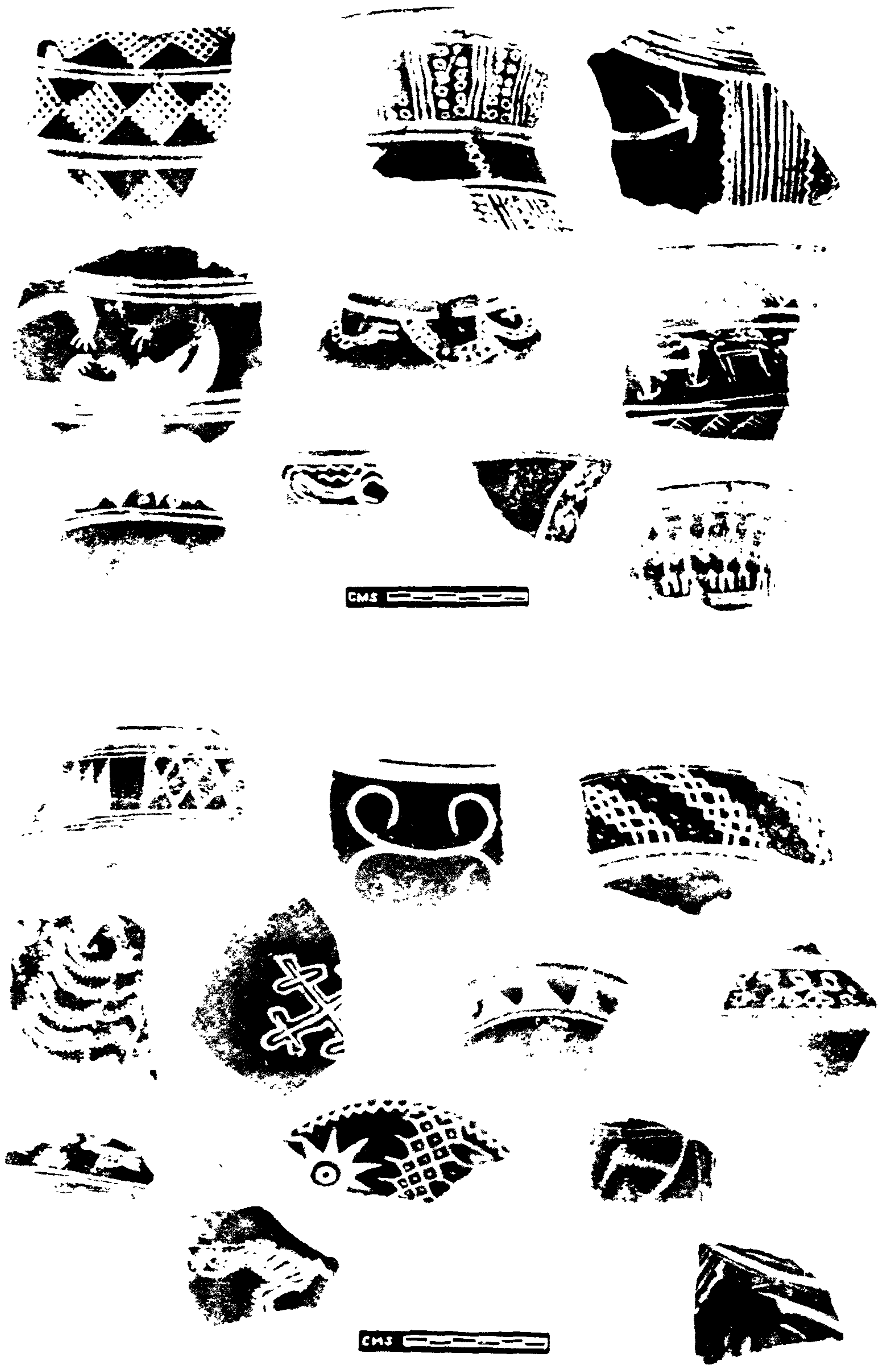


Fig. 83. Painted designs in White-slipped and Malwa Ware, Navdatoli.

Fig. 84. Painted designs in Malwa Ware, Navdatoli.

Fig. 86. (*a*) Applique design, standing woman.
(*b*) Applique design, monkey-like animal.
(*c*) Hearth, all from Navdatoli.

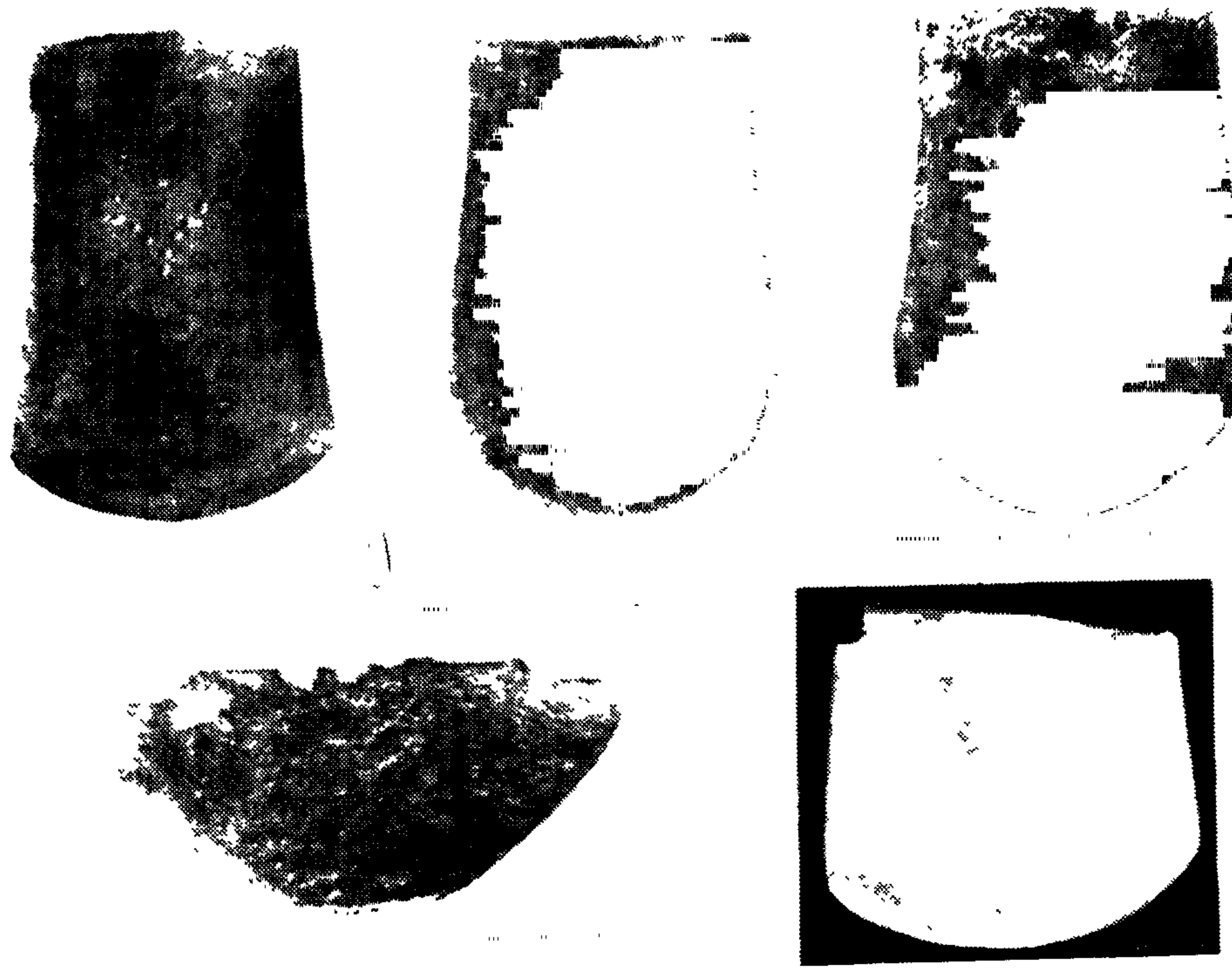


Fig. 87. Copper axes. Navdatoli.

Fig. 89. (*a*) Channel-spouted bowl in copper. Khurdi. Rajasthan.

(*b*) Spear-head or Dagger-head of copper from Chandoli.

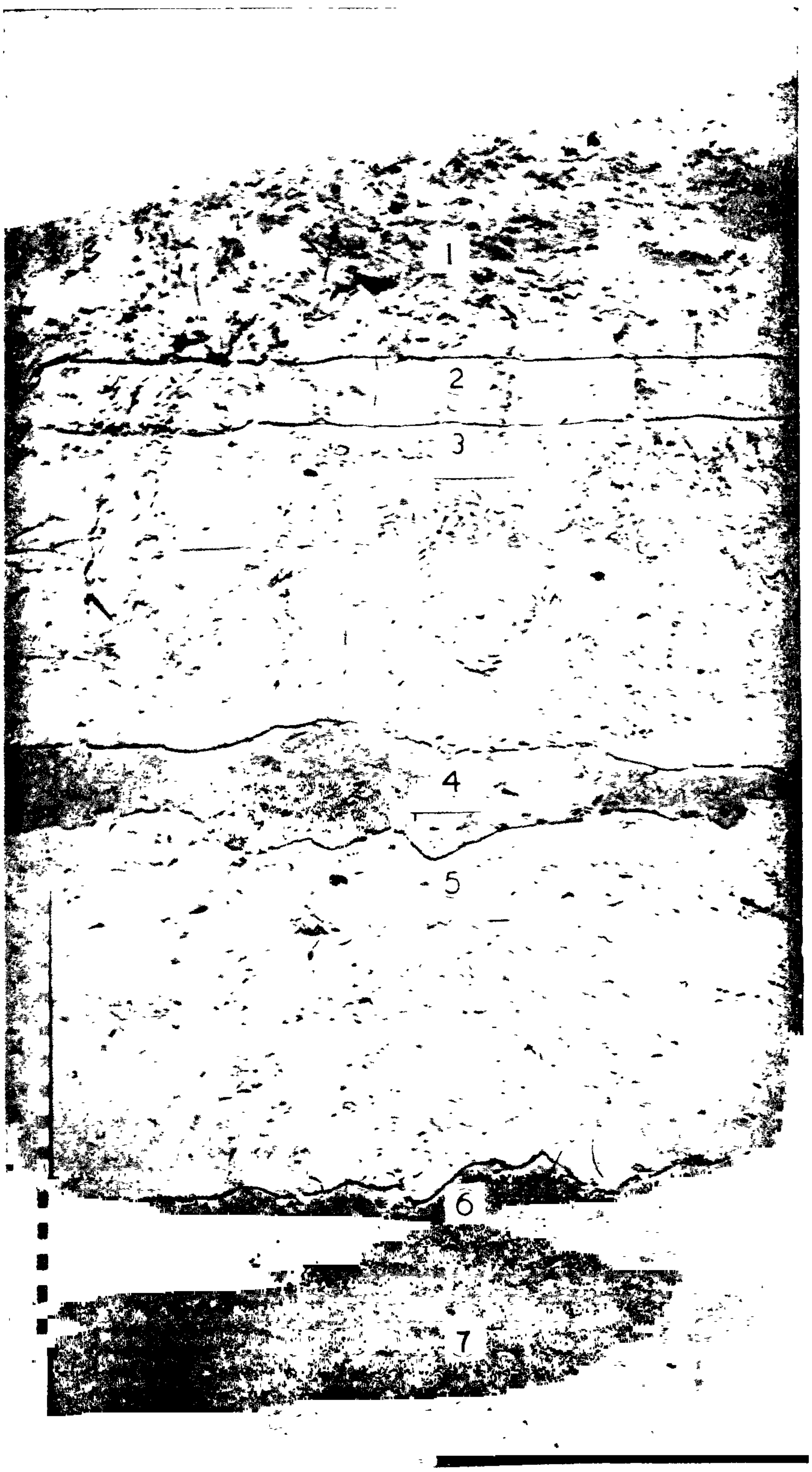


Fig. 100. Section showing the weathered layer **4**, Trench X, Nevasa, Maharashtra.

Fig. 101. (*a*) Group of urn-burials.

(*b*) Storage jar under a pot-burial.

(*c*) Storage jar (reconstructed), Nevasa.

Fig. 106. Polished Stone Axes (1-3); Chisel (4); Adze (5), Nevasa.

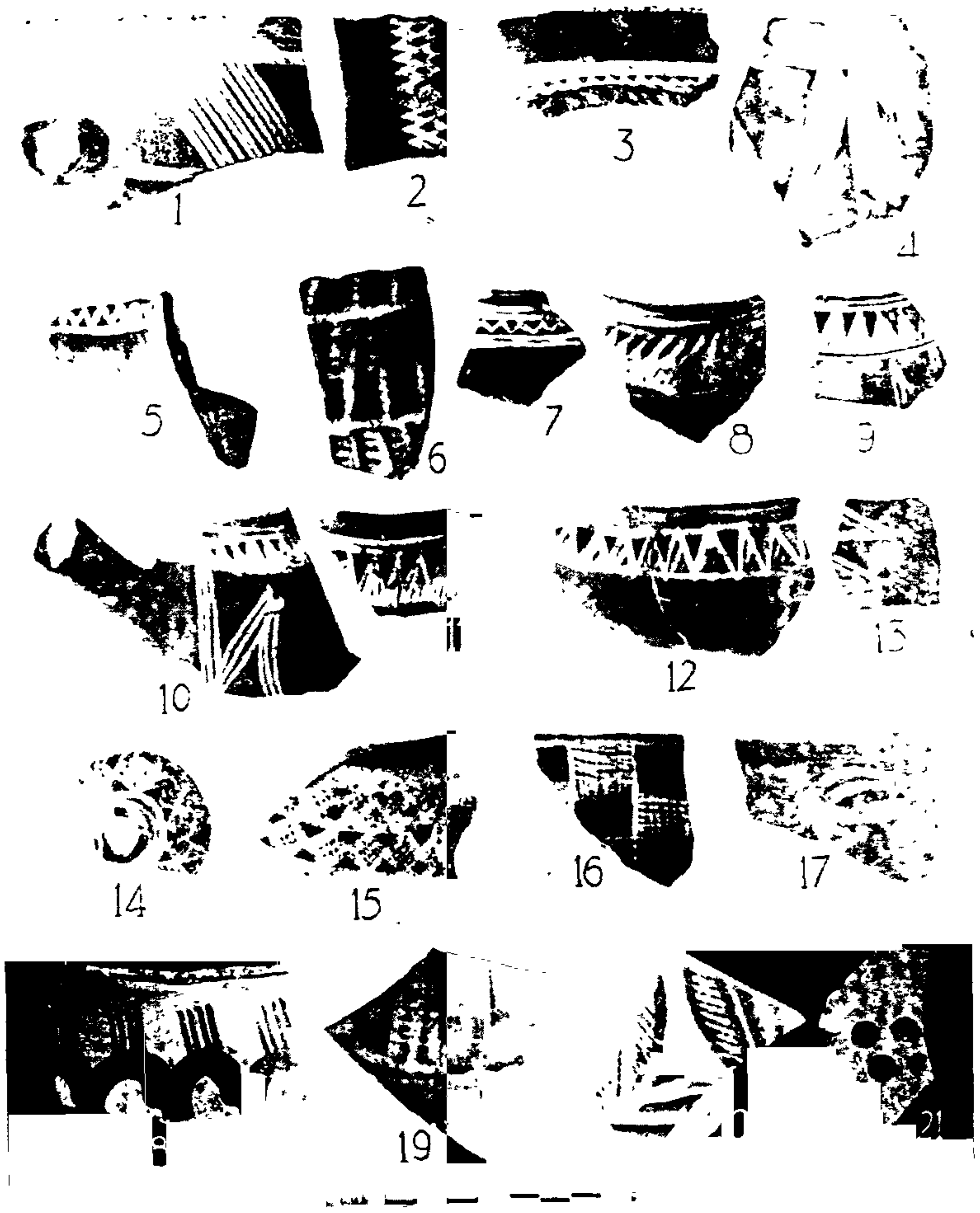


Fig. 97A.

(*a*) White-slipped Pot with elongated Sialk-like Iranian animals.

(*b*) Painted Designs (Both from Daimabad). Maharashtra.

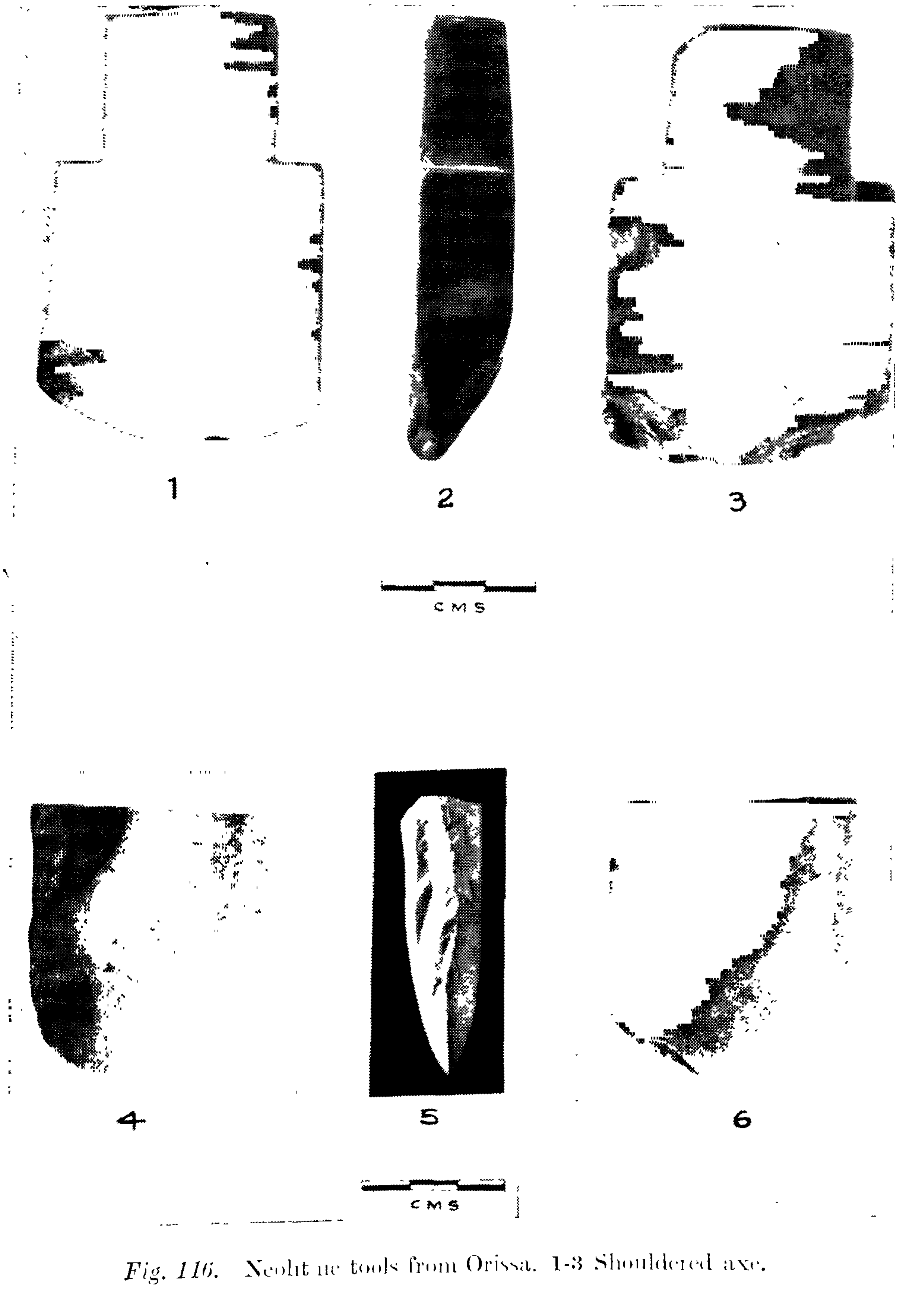


Fig. 116. Neolithic tools from Orissa. 1-3 Shouldered axe.

Fig. 125. View of excavations at Burzahom, near Srinagar, Kashmir.

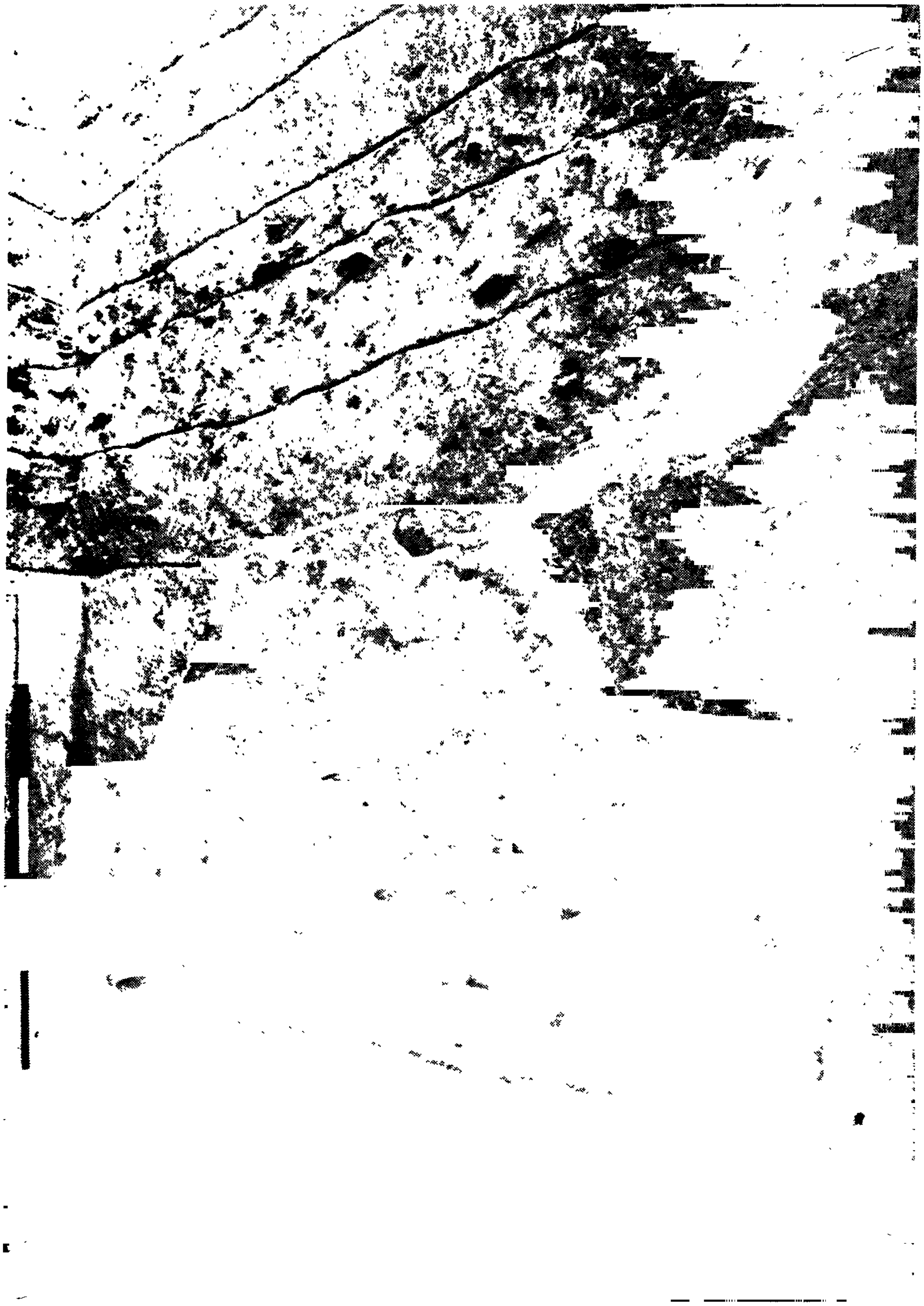


Fig. 126. Dwelling pit from Burzahom, Kashmir.

(a)

(c)

Fig. 127. (a) High-necked vessel in steel-grey ware from the earliest Pitdwelling, Phase I.

(b) Polished Stone Axes, Phase II.

(c) Polished bone tools, Phase II, all from Burzahom.

Fig. 128 (*a*) Pebble conglomerate on the right bank of the Mutha below Datta Wadi. Poona. It is capped by dark brown silt.

(*b*) Fine Gravel with light brown silt on the right bank of the Mutha below Datta Wadi. Poona: in the extreme right corner dark brown silt of the first cycle of deposits.

Fig. 129 Three terraces on the Narmada at Sagauna Ghat, Dist. Narsimhapur, M.P.

THE STONE AGE CULTURES AND CLIMATIC PHASES IN INDIA (EXCLUDING THE PANJAB & KAS[illegible]ALLEY)

Age		Climate	GUJARAT — Sabarmati: Formations	GUJARAT — Sabarmati: Cultures	W. RAJPUTANA AND SIND — Luni: Formations	W. RAJPUTANA AND SIND — Luni: Cultures	E. RAJPUTANA AND W. MADHYA PRADESH — Banas Chambal: Formations	E. RAJPUTANA AND W. MADHYA PRADESH — Banas Chambal: Cultures	MADHYA PRADESH — Narmada (Hoshangabad, Maheshwar): Formations	MADHYA PRADESH — Narmada (Hoshangabad, Maheshwar): Cultures
HOLOCENE	Sub-Recent	Dry	Surface Increased aridity (Y)	Microliths Pottery and Agriculture (Neolithic)	Surface	Chalcolithic	Surface	Chalcolithic	Regur clay, New Alluvium, Fine gravel or sand	Chalcolithic
HOLOCENE	Early Holocene	Dry	Soil develops on the Dunes(X), Dunes(W), Flat land surface (Slightly damp) (V), Aeolian Deposits of Sand (U)	Pre-pottery Microliths (Mesolithic)	Silt	Pre-pottery Microliths Mesolithic	Silt	Pre-pottery Microliths (Mesolithic)	Silt Upper Clay	Pre-pottery Microlith (Mesolithic) Survival of Middle Palaeolithic tool type
Late Pleistocene		Wet	Red Soil (T)	—	Gravel	Flake Industry and a few hand-axes and cleavers (Middle Palaeolithic or Nevasian)	Gravel (Fine)	Middle Palaeolithic or Nevasian	Gravel (Upper gravel)	Middle Palaeolithic or Late Soan and Rolled Lower Palaeolithic Abbevillio-Acheulian
Middle Pleistocene		Dry	Silt (S)	Developed Lower Palaeolithic (Acheulian) ?	Unknown	Unknown	Silt	Silt	Silt (Lower Clay)	Developed Lower Palaeolithic Fresh Acheulian Hand-axes and Flakes
Middle Pleistocene		Wet	Cemented Gravel (R)	Lower Palaeolithic Abbevillio-Acheulian	Unknown	Unknown	Gravel	Lower Palaeolithic Abbevillio-Acheulian	Gravel (Lower Gravel)	Lower Palaeolithic Abbevillio-Acheulian
Middle Pleistocene		Dry	Mottled Clay (Q)	—	Mottled Clay	—	—	—	—	—
Early Pleistocene		Wet	Allitic Weathering, Lateritic Crusts (P)	—	—	—	—	—	Primary Laterite	—

Age		Climate	MAHARASHTRA — Dahisar (Borivli): Formations	MAHARASHTRA — Dahisar (Borivli): Cultures	MAHARASHTRA — Godavari and Pravara: Formations	MAHARASHTRA — Godavari and Pravara: Cultures	KARNATAK — Malaprabha and Ghataprabha: Formations	KARNATAK — Malaprabha and Ghataprabha: Cultures	MADRAS — Kottalayar and Teris: Formations	MADRAS — Kottalayar and Teris: Cultures
HOLOCENE	Sub-Recent	Dry	Surface	Microliths, Mesolithic	Surface	Chalcolithic	Surface, Modern Clay Fine sand with a few small gravels	Chalcolithic	Surface, Sand-Dunes	Chalcolithic and Neolithic Microliths Mesolithic
HOLOCENE	Early Holocene	Dry	Yellowish loose gravel Silty Clay. Reddish-Brown Silt.	—	Fine sandy Gravel and Yellow Silt	Microliths, Upper Palaeolithic (?)	Fine Sandy Gravel. Dark Brown Clay.	Microliths. Upper Palaeolithic (?) or Series III. Survival of Middle Palaeolithic (Nevasian)	Sand-Dunes	Microliths (Mesolithic)
Late Pleistocene		Wet	Gravel (Fine)	Middle Palaeolithic	Gravel (Fine)	Middle Palaeolithic or Nevasian	Gravel (Fine)	Middle Palaeolithic or Nevasian	Unknown	Unknown
Middle Pleistocene		Dry	Unknown	Unknown	Yellow Silt	—	Sandy clay with Kankar	—	Unknown	Unknown
Middle Pleistocene		Wet	Cemented gravel	Lower Palaeolithic, (Abbevillio-Acheulian (?))	Gravel	Lower Palaeolithic or (Abbevillio-Acheulian)	Gravel	Lower Palaeolithic or (Abbevillio-Acheulian)	Secondary Laterite Boulder Conglomerate	Lower Palaeolithic or (Abbevillio-Acheulian)
Middle Pleistocene		Dry	Bluish-Brown clay	—	—	—	Mottled Clay	—	—	—
Early Pleistocene		Wet	—	—	—	—	Primary Laterite	—	—	—

Age		Climate	ORISSA — Brahmani and Burhabalang: Formations	ORISSA — Brahmani and Burhabalang: Cultures	S. E. COAST — Ralla Vagu and Others: Formations	S. E. COAST — Ralla Vagu and Others: Cultures	WEST BENGAL — Damodar-Kasai: Formations	WEST BENGAL — Damodar-Kasai: Cultures	MIRZAPUR — Singrauli: Formations	MIRZAPUR — Singrauli: Cultures
HOLOCENE	Sub-Recent	Dry	[illegible] flood deposit [illegible] the surface, [illegible] gravel and [illegible] the basin of rivers	Pottery and Groundstone Industry	Surface, Silt	Series IV (Pre-pottery) Non-geometric microliths	Surface	(Chalcolithic and Early Iron Age)	Surface	Microliths and Ground Stone
HOLOCENE	Early Holocene	Dry	[illegible] with Kankar	Microliths	Pebble-bed of small pieces of quartzite and sandstone silt Phase VI and VII	Developed Middle Palaeolithic. Series III and IV	Reddish silty sand with lateritic pebbles	Non-geometric microliths	Silt	Microliths (Mesolithic)
Late Pleistocene		Wet	[illegible] Silt Gravel [illegible] gravel and [illegible] Murram or Ferruginous [illegible] of laterite	Middle Palaeolithic or Nevasian	Pebble-bed of small pieces of quartzite and sandstone Phase V	Middle Palaeolithic Series II	—	Middle Palaeolithic	Gravel (Fine)	Unknown
Middle Pleistocene		Dry	Sa[illegible] Silt. Silt, Cl[illegible] with Kankar [illegible] sand	—	Weathered Secondary Laterit and Silt Phasee IV	Early Middle Palaeolithic and Developed Lower Palaeolithic. Series II and I	—	—	Silt	—
Middle Pleistocene		Wet	S[illegible] Laterite G[illegible] Gravel and [illegible]	Lower Palaeolithic	Derived Quartzite Pebbles and Secondary laterite Phase III	Lower Palaeolithic or Series I	—	Lower Palaeolithic (Abbevillio-Acheulian)	Gravel	Lower Palaeolithic (Abbevillio-Acheulian)
Middle Pleistocene		Dry	[illegible] Sand [illegible] clay	—	Phase II	Lower Palaeolithic or Series I	Gravel, stained red by iron oxide	Lower Palaeolithic (Abbevillio-Acheulian)	Mottled Clay	—
Early Pleistocene		Wet	[illegible] laterite	—	Primary laterite (Phase I)	—	Primary Laterite (?)	—	Primary Laterite (?)	—

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